

RAJ RANGAYYAN, PhD, PEng
FIEEE, FEIC, FAIMBE, FSPIE, FSIIM, FCMBS, FCAE, FRSC

CURRENT POSITION: Professor Emeritus of Electrical and Computer Engineering, University of Calgary.

RESEARCH: Dr. Rangayyan has developed several algorithms for biomedical signal and image processing applications, including analysis of mammograms for computer-aided diagnosis of breast cancer, analysis of collagen alignment and fine vascular anatomy to study ligament healing and treatment, high-resolution image data compression for digital teleradiology, computer-aided diagnosis of cartilage pathology via analysis of knee-joint vibration signals, and analysis of retinal vascular architecture in fundus images. He has more than 170 journal papers and more than 270 conference publications to his credit, and has completed the supervision or cosupervision of 27 Master's and 17 Doctoral theses. His research has been featured in many newsletters, magazines, and newspapers, as well as in several radio and television interviews.

Methods and software developed by Dr. Rangayyan have been used by researchers in Canada, the U.S.A., U.K., Brazil, Argentina, Malaysia, Spain, France, Italy, Romania, India, and China. He has brought to the University of Calgary more than 40 international visiting researchers. He is collaborating (or has collaborated) with researchers not only in Calgary, Alberta, and Canada, but also in Brazil, Russia, India, China, Italy, France, Spain, Romania, Croatia, Malaysia, the U.S.A., and the U.K.

TEACHING: ENGG 213 Engineering Computation; ENGG 215 Engineering Practice, Design, and Communication; ENGG 233 Computing for Engineers I; ENGG 303 Electrical Circuits and Machines; ENGG 323 Systems and Instrumentation; ENGG 333 Computing for Engineers II; ENEL 327 Signals and Systems; ENEL 563 Biomedical Signal Analysis; ENEL 593 Digital Filters; ENEL 599 Electrical Engineering Project; ENEL 697 Digital Image Processing. 24.208 Electric Circuits; 24.358 Signal Analysis III; 24.426 Communication Systems; 24.815 Digital Signal Processing; 24.822 Digital Image Processing.

Outstanding Teaching Performance Award of the Schulich School of Engineering (2016).

Dr. Rangayyan is the author of two textbooks: "Biomedical Signal Analysis" (516 pages, IEEE and Wiley, 2002; 2nd ed., 672 pages, IEEE and Wiley, 2015) and "Biomedical Image Analysis" (1306 pages, CRC, 2005), and the coauthor or coeditor of several other books, including "Color Image Processing with Biomedical Applications" (434 pages, SPIE, 2011).

Dr. Rangayyan has lectured in more than 20 countries. He has held Visiting Professorships with the University of Liverpool, Liverpool, UK; Tampere University of Technology, Tampere, Finland; Universitatea Politehnica București, Bucharest, Romania; Universidade de São Paulo, São Paulo, Brasil; Universidade Estadual Paulista, Sorocaba, Brasil; Cleveland Clinic Foundation, Cleveland, OH; Indian Institute of Science, Bangalore, India; Indian Institute of Technology, Kharagpur, India; Manipal Institute of Technology, Manipal, India; Amity University, Noida, India; Beijing University of Posts and Telecommunications, Beijing, China; Xiamen University, Xiamen, Fujian, China; Kyushu University, Fukuoka, Japan; University of Rome Tor Vergata, Rome, Italy; and École Nationale Supérieure des Télécommunications de Bretagne, Brest, France. He has been recognized as a Distinguished Lecturer by the IEEE Engineering in Medicine and Biology Society (EMBS), the University of Toronto, and the Hong Kong Institution of Engineers. He was an invited lecturer at the prestigious 11th IEEE EMBS International Summer School on Biomedical Imaging, Bretagne, France, 2014.

AWARDS AND RECOGNITION: *Fellow*, Royal Society of Canada (2016); ***Outstanding Engineer***, IEEE Canada (2013); ***Fellow, CAE*** (2009); ***Fellow, CMBES*** (2007); ***Fellow, SIIM*** (2007); ***Fellow, SPIE*** (2003); ***Fellow, AIMBE*** (2003); ***Fellow, EIC*** (2002); ***Fellow, IEEE*** (2001); IEEE Third Millennium Medal (2000); "University Professor" (2003-2013); Killam Resident Fellowship (1999, 2002, 2007); ***Research Excellence Awards***, Department of Electrical and Computer Engineering (1997, 2001); ***Research Excellence Award***, Faculty of Engineering (1997); Outstanding Service Award, India-Canada Association of Calgary (1997); Excellence in Professional Field Award, India-Canada Association of Calgary (2002).

INTERACTION WITH INDUSTRY: Dr. Rangayyan has consulted for and provided expert advice for many companies, corporations, and institutions.

SERVICE AND LEADERSHIP: ***Associate Vice-President (Research)*** (2000-2002). Acting Head (1991-92) and Associate Head for Undergraduate Studies (1993-94), Department of Electrical and Computer Engineering. ***Associate Editor***, IEEE Transactions on Biomedical Engineering (1989-96). ***Program Chair***, 15th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS), San Diego, CA, 1993. Program Co-Chair, 20th Annual International Conference of the IEEE EMBS, Hong Kong, 1998. Co-Chair and Co-Editor, IASTED International Conference on Telehealth, Banff, AB, 2005. Program Committee, International Congress on Computer Assisted Radiology and Surgery, 2008-2016.



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Education:

Ph.D., Electrical Engineering, Indian Institute of Science, Bangalore, India (1980).

Bachelor of Engineering (B.E.), Electronics and Communication Engineering, University of Mysore, India (1976).

Positions Held:

Professor Emeritus of Electrical and Computer Engineering (2016-)

"University Professor," University of Calgary (2003-2013).

Associate Vice-President (Research) (2000-2002).

Professor, Department of Electrical and Computer Engineering (1989-2016).

Adjunct Professor, Departments of Surgery and Radiology (1992-2018).

Fellow, Latin American Research Centre (2006-present).

Associate Head (Undergraduate Studies), Department of Electrical and Computer Engineering (1993-94).

Acting Head, Department of Electrical and Computer Engineering (1991-92).

(Please see Sections K and R for Institutions Visited and Visiting Appointments held.)

Associate Professor, Department of Electrical Engineering, University of Calgary (1984-89).

Assistant Professor, Department of Electrical Engineering, University of Manitoba, Winnipeg, Canada (1982-84).

Systems Analyst, Department of Pathology, University of Manitoba, Winnipeg, Canada (1981-82).

Project Assistant, School of Automation, Indian Institute of Science, Bangalore, India (1980-81).

Registered Professional Engineer in the Province of Alberta, Canada, (1986-present).

Professional Interests:

Research and teaching in the areas Biomedical Engineering, Digital Signal Processing, Digital Image Processing, Signals and Systems, Biomedical Signal and Image Analysis, Computer Vision, Pattern Recognition, Medical Imaging, and Computer-aided diagnosis.

Other Interests:

Classical Music of India, Bansuri, Sitar, Rudra Veena, Chinese Music (Gu-zheng), Percussion, Fusion Music, Photography.

A. Papers in Refereed Journals

h-index = 64, i10-index = 247, citations = 17,700+, according to Google Scholar (29 January 2022).

Numbering of entries in each category, in reversed chronological order, starts with the first such item in my career. The top-most entry number is my career total in each category. The names of my research students/ trainees are underlined.

173. A.P. Magalhães Tenório, J.R. Ferreira-Júnior, V.F. Dalto, M.C. Faleiros, R. Luppino-Assad, P. Louzada-Junior, M.H. Nogueira-Barbosa, R.M. Rangayyan, and P.M. Azevedo-Marques, "Radiomic Quantification for MRI Assessment of Sacroiliac Joints of Patients with Spondyloarthritis," Journal of Digital Imaging, <https://doi.org/10.1007/s10278-021-00559-7>, Online 2022-01-07. 10 pages.
172. M.C. Faleiros, M.H. Nogueira-Barbosa, V.F. Dalto, J.R. Ferreira Júnior, A.P. Magalhães Tenório, R. Luppino-Assad, P. Louzada-Junior, R.M. Rangayyan, P.M. Azevedo-Marques, "Machine learning techniques for computer-aided classification of active inflammatory sacroiliitis in magnetic resonance imaging," Advances in Rheumatology (2020) 60:25, <https://doi.org/10.1186/s42358-020-00126-8>
171. F.C.F. Dionísio, L.S. Oliveira, M.A. Hernandez, E.E. Engel, R.M. Rangayyan, P.M. Azevedo-Marques, M.H. Nogueira-Barbosa, "Manual and semiautomatic segmentation of bone sarcomas on MRI have high similarity," Brazilian Journal of Medical and Biological Research, 2020, 53(2): e8962, DOI: 10.1590/1414-431X20198962
170. J. Chakraborty, A. Midya, S. Mukhopadhyay, R. M. Rangayyan, A. Sadhu, V. Singla, N. Khandelwal, "Computer-Aided Detection of Mammographic Masses using Hybrid Region Growing Controlled by Multilevel Thresholding," DOI: 10.1007/s40846-018-0415-9. Journal of Medical and Biological Engineering, June 2019, Volume 39, Issue 3, pp 352–366
169. I. Cardoso, E. Almeida, H. Allende-Cid, A. C. Frery, R. M. Rangayyan, P. M. Azevedo-Marques, H. S. Ramos, "Analysis of Machine Learning Algorithms for Diagnosis of Diffuse Lung Diseases," Methods of Information in Medicine, 2018 Nov., 57(5-6):272-279. doi: 10.1055/s-0039-1681086.
168. Y. F. Wu, Y. C. Yao, Y. G. Xiao, X. Q. Ye, P. Chen, L. F. Liao, M. H. Wu, R. M. Rangayyan, "Separation and identification of rhythm components of local field potential signals in awake mice using ensemble empirical mode decomposition," Biomedical Engineering: Applications, Basis and Communications, 2017, 29(4): 1750029. <https://doi.org/10.4015/S1016237217500296>
167. Y. F. Wu, P. Chen, X. Luo, M. H. Wu, L. F. Liao, S. S. Yang, R. M. Rangayyan, "Measuring signal fluctuations in gait rhythm time series of patients with Parkinson's disease using entropy parameters," Biomedical Signal Processing and Control 31: 265–271, January 2017, <http://dx.doi.org/10.1016/j.bspc.2016.08.022>.
166. F. Oloumi, R.M. Rangayyan, and A.L. Ells, "Computer-aided Diagnosis of Retinopathy in Retinal Fundus Images of Preterm Infants via Quantification of Vascular Tortuosity," SPIE Journal of Medical Imaging 3(4): paper no. 044505 (Oct-Dec 2016), doi: 10.1117/1.JMI.3.4.044505.
165. M. Mustra, M. Grgic, and R.M. Rangayyan, "Review of recent advances in segmentation of the breast boundary and the pectoral muscle in mammograms," Medical and Biological Engineering and Computing, 54(7):1003–1024, July 2016. DOI 10.1007/s11517-015-1411-7.
164. L. Frighetto-Pereira, R. M. Rangayyan, G. A. Metzner, P. M. Azevedo-Marques, and M. H. Nogueira-Barbosa, "Shape, texture, and statistical features for classification of benign and malignant vertebral compression fractures in magnetic resonance images," Computers in Biology and Medicine, 73(2016):147–156, 2016.
163. Y. F. Wu, P. Chen, X. Luo, H. Huang, L. Liao, Y. Yao, M. Wu, R. M. Rangayyan, "Quantification of Knee Vibroarthrographic Signal Irregularity Associated with Patellofemoral Joint Cartilage Pathology Based on Entropy and Envelope Amplitude Measures," Computer Methods and Programs in Biomedicine, 130:1-12, July 2016. DOI: <http://dx.doi.org/10.1016/j.cmpb.2016.03.021>
162. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. F. Mangieri, M. L. Pepe, R. M. Rangayyan, "Contour-Independent Detection and Classification of Mammographic Lesions," Biomedical Signal Processing and Control, 25:165-177, March 2016.
161. I. Cruz-Aceves, F. Oloumi, R. M. Rangayyan, J. G. Aviña-Cervantes, and A. Hernandez-Aguirre, "Automatic segmentation of coronary arteries using Gabor filters and thresholding based on multiobjective optimization," Biomedical Signal Processing and Control, 25:76-85, March 2016.

160. F. Oloumi, R. M. Rangayyan, P. Casti, A. L. Ells, "Computer-aided Diagnosis of Plus Disease via Measurement of Vessel Thickness in Retinal Fundus Images of Preterm Infants," *Computers in Biology and Medicine*, 66:316-329, Nov. 2015.
159. P. Casti, A. Mencattini, M. Salmeri, R. M. Rangayyan, "Analysis of Structural Similarity in Mammograms for Detection of Bilateral Asymmetry," *IEEE Transactions on Medical Imaging*, 34(2):662-671, February 2015. DOI 10.1109/TMI.2014.2365436
158. J. Chakraborty, A. Midya, S. Mukhopadhyay, R. M. Rangayyan, A. Sadhu, V. Singla, N. Khandelwal, P. Bhattacharyya, and P. M. Azevedo-Marques, "Detection of the Nipple in Mammograms with Gabor Filters and the Radon Transform," *Biomedical Signal Processing and Control*, 15:80-89, January 2015. doi:10.1016/j.bspc.2014.09.001
157. F. Oloumi, R.M. Rangayyan, and A.L. Ells, "Quantification of the Changes in the Openness of the Major Temporal Arcade in Retinal Fundus Images of Preterm Infants with Plus Disease," *Investigative Ophthalmology & Visual Science*, 55:6728-6735, October 2014. doi:10.1167/iovs.13-13640.
156. F. Oloumi, A. K. Dhara, R. M. Rangayyan, and S. Mukhopadhyay, "Detection of Blood Vessels in Retinal Fundus Images," *Computer Science Journal of Moldova*, Invited Article, 22(2:65):155-185, 2014.
155. L. C. Pereyra, S. M. Pereira, J. P. Souza, M. A. C. Frade, R. M. Rangayyan, P. M. Azevedo-Marques, "Characterization and pattern recognition of color images of dermatological ulcers: a pilot study," *Computer Science Journal of Moldova*, Invited Article, 22(2:65):211-235, 2014.
154. F. Oloumi, R. M. Rangayyan, and A. L. Ells, "Computer-aided Diagnosis of Proliferative Diabetic Retinopathy via Modeling of the Major Temporal Arcade in Retinal Fundus Images." *Journal of Digital Imaging*, 26(6): 1124-1130, December 2013. DOI 10.1007/s10278-013-9592-9.
153. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. Mangeri, M. L. Pepe, R. M. Rangayyan, "Estimation of the breast skin-line in mammograms using multidirectional Gabor filters." *Computers in Biology and Medicine*, 43(11): 1870-1881, November 2013.
152. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. Mangeri, M. L. Pepe, R. M. Rangayyan, "Automatic detection of the nipple in screen-film and full-field digital mammograms using a novel Hessian-based method ." *Journal of Digital Imaging*, 26(5): 948-957, October 2013. DOI 10.1007/s10278-013-9587-6
151. R. M. Rangayyan, S. Banik, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms via Analysis of Oriented Patterns," invited article, *Journal of Visualized Experiments*, August 2013, e50341, article with 19 pages and online video. URL: <http://www.jove.com/video/50341>. DOI: doi:10.3791/50341.
150. R. M. Rangayyan, S. Banik, J. Chakraborty, S. Mukhopadhyay, and J. E. L. Desautels, "Measures of Divergence of Oriented Patterns for the Detection of Architectural Distortion in Prior Mammograms," *International Journal of Computer Assisted Radiology and Surgery*, 8(4):527-545, July 2013. DOI 10.1007/s11548-012-0793-3.
149. K.Y. Liu, M.R. Smith, E. Fear, and R.M. Rangayyan, "Evaluation and Amelioration of Computer-Aided Diagnosis with Artificial Neural Networks Utilizing Small-Sized Sample Sets," *Biomedical Signal Processing and Control*, 8(3):255-262, May 2013.
148. S. M. Pereira, M. A. C. Frade, R. M. Rangayyan, P. M. Azevedo-Marques, "Classification of color images of dermatological ulcers," *IEEE Journal of Biomedical and Health Informatics*, 17(1):136-142, January 2013. DOI 0.1109/TITB.2012.2227493
147. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Measures of Angular Spread and Entropy for the Detection of Architectural Distortion in Prior Mammograms," *International Journal of Computer Assisted Radiology and Surgery*, 8(1): 121-134, January 2013. DOI 10.1007/s11548-012-0681-x.
146. R. M. Rangayyan, F. Oloumi, Y.F. Wu, and S.X. Cai, "Fractal Analysis of Knee-joint Vibroarthrographic Signals via Power Spectral Analysis," *Biomedical Signal Processing and Control*, 8(1):23-29, January 2013. DOI 10.1016/j.bspc.2012.05.004.

145. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Detection of architectural distortion using statistical measures of correlation and stationarity," *Rendiconti del Circolo Matematico di Palermo, Serie II, Suppl. 84*, pp. 33-42, 2012.
144. F. Oloumi, R. M. Rangayyan, and A.L. Ells, "Parabolic Modeling of the Major Temporal Arcade in Retinal Fundus Images," *IEEE Transactions on Instrumentation & Measurement*, 61(7): 1825-1838, July 2012. DOI 10.1109/TIM.2012.2192339.
143. J. Chakraborty, R. M. Rangayyan, S. Banik, S. Mukhopadhyay, and J. E. L. Desautels, "Statistical Measures of Orientation of Texture for the Detection of Architectural Distortion in Prior Mammograms of Interval-Cancer," *Journal of Electronic Imaging*, 21(3), 033010:1-13, July 2012. DOI: 10.1117/1.JEI.21.3.033010.
142. R. M. Rangayyan and F. Oloumi, "Fractal analysis and classification of breast masses using the power spectra of signatures of contours," *Journal of Electronic Imaging*, 21(2), 023018:1-9, April 2012. DOI: 10.1117/1.JEI.21.2.023018.
141. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms," *IEEE Transactions on Medical Imaging*, 30(2):279-294, February 2011. DOI 10.1109/TMI.2010.2076828. **Winner of Canadian Institutes of Health Research: Institute of Cancer Research Publication Prize for 2011.**
140. Y.F. Wu, S. Krishnan, and R.M. Rangayyan, "Computer-aided Diagnosis of Knee-joint Disorders via Vibroarthrographic Signal Analysis: A Review," *CRC Critical Reviews in Biomedical Engineering*, 38(2):201-224, 2010.
139. R.M. Rangayyan, S. Banik, and J.E.L. Desautels, "Computer-aided Detection of Architectural Distortion in Prior Mammograms of Interval Cancer," *Journal of Digital Imaging*, 23(5):611-631, October 2010. DOI 10.1007/s10278-009-9257-x.
138. R.M. Rangayyan, T. M. Nguyen, F.J. Ayres, and A. K. Nandi, "Effect of Pixel Resolution on Texture Features of Breast Masses in Mammograms," *Journal of Digital Imaging*, 23(5):547-553, October 2010. DOI 10.1007/s10278-009-9238-0.
137. R.M. Rangayyan, X. Zhu, F.J. Ayres, and A.L. Ells, "Detection of the Optic Nerve Head in Fundus Images of the Retina with Gabor Filters and Phase Portrait Analysis," *Journal of Digital Imaging*, 23(4):438-453, August 2010. doi:10.1007/s10278-009-9261-1.
136. I. Kamenetsky, R.M. Rangayyan, and H. Benediktsson, "Analysis of the Glomerular Basement Membrane in Images of Renal Biopsies Using the Split-and-Merge Method: A Pilot Study," *Journal of Digital Imaging*, 23(4):463-474, August 2010. DOI 10.1007/s10278-009-9233-5
135. R.M. Rangayyan, I. Kamenetsky, and H. Benediktsson, "Segmentation and Analysis of the Glomerular Basement Membrane in Renal Biopsy Samples Using Active Contours: A Pilot Study," *Journal of Digital Imaging*. doi: 10.1007/s10278-009-9188-6. 23(3):323-331, June 2010.
134. S. Banik, R.M. Rangayyan, and G.S. Boag, "Automatic Segmentation of the Ribs, the Vertebral Column, and the Spinal Canal in Pediatric Computed Tomographic Images," *Journal of Digital Imaging*, doi: 10.1007/s10278-009-9176-x, 23(3):301-322, June 2010.
133. X. Zhu, R.M. Rangayyan, and A.L. Ells, "Detection of the Optic Nerve Head in Fundus Images of the Retina Using the Hough Transform for Circles," *Journal of Digital Imaging*. doi: 10.1007/s10278-009-9189-5. 23(3):332-341, June 2010.
132. R.M. Rangayyan and Y.F. Wu, "Screening of Knee-joint Vibroarthrographic Signals Using Probability Density Functions Estimated with Parzen Windows," *Biomedical Signal Processing & Control*, January 2010, 5(1):53-58. doi:10.1016/j.bspc.2009.03.008.
131. Y.F. Wu and R.M. Rangayyan, "An Unbiased Linear Adaptive Filter with Normalized Coefficients for the Removal of Noise in Electrocardiographic Signals," *International Journal of Cognitive Informatics and Natural Intelligence*, vol. 3, no. 4, pp. 73-90, Oct.-Dec. 2009. DOI: 10.4018/jcini.2009062305.
130. D. Guliato, R.S. Bôaventura, M. Maia, R.M. Rangayyan, M.S. Simedo, and T.A.A. Macedo, "INDIAM - An e-Learning System for the Interpretation of Mammograms," *Journal of Digital Imaging*, 22(4):405-420, August 2009, doi: 10.1007/s10278-008-9111-6.

129. S. Banik, R.M. Rangayyan, G.S. Boag, R.H. Vu, "Segmentation of the Pelvic Girdle in Pediatric Computed Tomographic Images," *Journal of Electronic Imaging*, 18(3), article number 033005:1-11, (July – September 2009). DOI: 10.1117/1.3184783.
128. R. do Espírito Santo, R. de Deus Lopes, and R.M. Rangayyan, "Classification of breast masses in mammograms using radial basis functions and simulated annealing," *International Journal of Cognitive Informatics and Natural Intelligence*, 3(3): 27-38, July-September 2009.
127. M.R. Smith, X. Wang, R. M. Rangayyan, "Evaluation of the Sensitivity of a Medical Data-mining Application to the Number of Elements in Small Databases," *Biomedical Signal Processing & Control*. doi:10.1016/j.bspc.2009.04.001. 4 (3):262–268, July 2009.
126. R.M. Rangayyan, S. Banik, G.S. Boag, "Landmarking and Segmentation of Computed Tomographic Images of Pediatric Patients with Neuroblastoma," *International Journal of Computer Assisted Radiology and Surgery*. DOI 10.1007/s11548-009-0289-y. May 2009. 4(3):245-262.
125. D. Guliato, E.V. de Melo, R.M. Rangayyan, and R.C. Soares, "POSTGRESQL-IE: An Image-handling Extension for PostgreSQL," *Journal of Digital Imaging*. DOI: 10.1007/s10278-007-9097-5, 22(2): 149-165, April 2009.
124. J. Tang, R. M. Rangayyan, J. Xu, I. El Naqa, Y. Yang, "Computer-Aided Detection and Diagnosis of Breast Cancer with Mammography: Recent Advances," *IEEE Transactions on Information Technology in Biomedicine*, March 2009, 13(2):236-251. DOI: 10.1109/TITB.2008.2009441.
123. C. Serrano, B. Acha, R.M. Rangayyan, and J.E.L. Desautels, "Detection of microcalcifications in mammograms using error of prediction and statistical measures," *Journal of Electronic Imaging* 18(1), 013011:1-10, Jan.–Mar. 2009. DOI: 10.1117/1.3099710.
122. Y.F. Wu, R.M. Rangayyan, Y. Zhou, and S.C. Ng, "Filtering electrocardiographic signals using an unbiased and normalized adaptive noise reduction system," *Medical Engineering & Physics*, 31(1):17-26, January 2009. DOI:10.1016/j.medengphy. 2008.03.004. Correction: 31(5):614, June 2009.
121. R.M. Rangayyan and Y.F. Wu, "Analysis of vibroarthrographic signals with features related to signal variability and radial-basis functions," *Annals of Biomedical Engineering*, 37(1):156-163, Jan. 2009. DOI: 10.1007/s10439-008-9601-1.
120. R.M. Rangayyan, R.H. Vu, and G.S. Boag, "Automatic Delineation of the Diaphragm in Computed Tomographic Images," *Journal of Digital Imaging*, vol. 21, supplement 1, pp S134-S147, doi: 10.1007/s10278-007-9091-y, November 2008.
119. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Screening of Knee-joint Vibroarthrographic Signals Using the Strict 2-Surface Proximal Classifier and Genetic Algorithm," *Computers in Biology and Medicine*, 38(10):1103-1111, October 2008. doi:10.1016/j.combiomed.2008.08.009.
118. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Classification of Breast Masses Using Selected Shape, Edge-sharpness, and Texture Features with Linear and Kernel-based Classifiers," *Journal of Digital Imaging*, doi: 10.1007/s10278-007-9102-z, 21(2):153—169, June 2008.
117. D. Guliato, J. Daloia de Carvalho, R.M. Rangayyan, S. A. Santiago, "Feature Extraction from a Signature based on the Turning Angle Function for the Classification of Breast Tumors," *Journal of Digital Imaging*, DOI: 10.1007/s10278-007-9069-9, 21(2): 129 – 144, June 2008.
116. P.M. de Azevedo-Marques, N.A. Rosa, A.J.M. Traina, C. Traina Junior, S.K. Kinoshita, and R.M. Rangayyan, "Reducing the Semantic Gap in Content-based Image Retrieval in Mammography with Relevance Feedback and Inclusion of Expert Knowledge," *International Journal of Computer Assisted Radiology and Surgery*, DOI 10.1007/s11548-008-0154-4. 3(1-2):123-130, June 2008.
115. R.M. Rangayyan, F.J. Ayres, Faraz Oloumi, Foad Oloumi, and P. Eshghzadeh-Zanjani, "Detection of Blood Vessels in the Retina with Multiscale Gabor Filters", *Journal of Electronic Imaging*, 17(2), 023018:1-7, Apr–Jun 2008. DOI: 10.1117/1.2907209.
114. R.M. Rangayyan, D. Guliato, J. Daloia de Carvalho, S. A. Santiago, "Polygonal Approximation of Contours based on the Turning Angle Function," *Journal of Electronic Imaging*, 17(2), 023016:1-14, Apr–Jun 2008. DOI 10.1117/1.2920413.

113. R.M. Rangayyan, S. Prajna, F.J. Ayres, and J.E.L. Desautels, "Detection of Architectural Distortion in Prior Mammograms Using Gabor Filters, Phase Portraits, Fractal Dimension, and Texture Analysis," *International Journal of Computer Assisted Radiology and Surgery*, DOI 10.1007/s11548-007-0143-z. 2(6): 347-361, April 2008. Correction: *International Journal of Computer Assisted Radiology and Surgery*, DOI 10.1007/s11548-010-0408-9. 5(4): 421-423, July 2010.
112. R.M. Rangayyan and Y.F. Wu, "Screening of Knee-joint Vibroarthrographic Signals Using Statistical Parameters and Radial Basis Functions," *Medical and Biological Engineering and Computing*, DOI 10.1007/s11517-007-0278-7, 46(3):223–232, March 2008.
111. S. K. Kinoshita, P.M. de Azevedo-Marques, R.R. Pereira Júnior, J.A.H. Rodrigues, and R.M. Rangayyan, "Radon-domain detection of the nipple and the pectoral muscle in mammograms," DOI 10.1007/s10278-007-9035-6. *Journal of Digital Imaging*, 21(1): 37 – 49, March 2008.
110. L.A. Silva, E. del Moral Hernandez, and R.M. Rangayyan, "Classification of breast masses using a committee machine of artificial neural networks," *Journal of Electronic Imaging*, 17(1), 013017:1-10, Jan.–Mar. 2008.
109. D. Guliato, R.M. Rangayyan, J. Daloia de Carvalho, S. A. Santiago, "Polygonal Modeling of Contours of Breast Tumors with the Preservation of Spicules," *IEEE Transactions on Biomedical Engineering*, 10.1109/TBME.2007.899310, 55(1):14-20, January 2008.
108. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Analysis of Breast Tumors in Mammograms Using the Pairwise Rayleigh Quotient Classifier," *Journal of Electronic Imaging*, 16(4):043004:1-11, Oct.-Dec. 2007. DOI 10.1117/1.2803834.
107. R.M. Rangayyan and T.M. Nguyen, "Fractal analysis of contours of breast masses in mammograms," *Journal of Digital Imaging*, 20(3):223-237, Sept. 2007, DOI 10.1007/s10278-006-0860-9.
106. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Classification of Breast Masses via Nonlinear Transformation of Features Based on a Kernel Matrix," *Medical and Biological Engineering and Computing*, 45(8): 769-780, August 2007. DOI 10.1007/s11517-007-0211-0.
105. S. K. Kinoshita, P.M. de Azevedo-Marques, R.R. Pereira Júnior, J.A.H. Rodrigues, and R.M. Rangayyan, "Content-based retrieval of mammograms using visual features related to breast density patterns," *Journal of Digital Imaging*, 20(2): 172-190, June 2007. DOI 10.1007/s10278-007-9004-0.
104. R.M. Rangayyan, F.J. Ayres, and J.E.L. Desautels, "A review of computer-aided diagnosis of breast cancer: Toward the detection of early signs," *Journal of the Franklin Institute*, doi:10.1016/j.jfranklin.2006.09.003, 344 (3-4) 312 – 348, May 2007.
103. R.H. Vu, R.M. Rangayyan, H.J. Deglint, and G.S. Boag, "Segmentation and analysis of neuroblastoma," *Journal of the Franklin Institute*, doi:10.1016/j.jfranklin.2006.11.002, 344(3-4): 257 – 284, May 2007.
102. F. J. Ayres and R.M. Rangayyan, "Design and performance analysis of oriented feature detectors," *Journal of Electronic Imaging*, 16(2):023007:1-12, April 2007. DOI: 10.1117/1.2728751.
101. F. J. Ayres and R.M. Rangayyan, "Reduction of false positives in the detection of architectural distortion in mammograms by using a shape-constrained phase portrait model," *International Journal of Computer Assisted Radiology and Surgery*, DOI 10.1007/s11548-007-0072-x, 1(6): 361 – 369, April 2007.
100. H.J. Deglint, R.M. Rangayyan, F.J. Ayres, G.S. Boag, and M.K. Zuffo, "Three-dimensional segmentation of the tumor in computed tomographic images of neuroblastoma," *Journal of Digital Imaging*, DOI 10.1007/10278-006-0769-3, 20(1): 72 – 87, March 2007. Also published as 20(3): 263 – 278, September 2007.
99. R.M. Rangayyan, R.J. Ferrari, and A.F. Frère, "Analysis of bilateral asymmetry in mammograms using directional, morphological, and density features," *Journal of Electronic Imaging*, 16(1), 013003:1-12 (Jan–Mar) 2007.
98. R.M. Rangayyan and F.J. Ayres, "Detection of architectural distortion in mammograms using Gabor filters and phase portraits," *Medical and Biological Engineering and Computing*, 44(10):883–894, Oct. 2006, DOI 10.1007/s11517-006-0088-3.

97. R.J. Nandi, A.K. Nandi, R.M. Rangayyan, and D. Scutt, "Classification of breast masses in mammograms using genetic programming and feature selection," *Medical and Biological Engineering and Computing*, 44 (8): 683–694, Aug. 2006, DOI 10.1007/s11517-006-0077-6.
96. R.M. Rangayyan, H.J. Deglint, and G.S. Boag, "A method for the automatic extraction of the spinal canal in CT images," *Journal of Electronic Imaging*, Jul. – Sep. 2006, Vol. 15, No. 3, Article 033007, pp 1 – 9.
95. Y. Sun, J. Suri, J.E.L. Desautels, and R.M. Rangayyan, "A new approach for breast skin-line estimation in mammograms," *Pattern Analysis and Applications*, May 2006, 9(1): 34–47, DOI 10.1007/s10044-006-0023-0.
94. T.C.S.S. André and R.M. Rangayyan, "Classification of breast masses in mammograms using neural networks with shape, edge sharpness, and texture features," *Journal of Electronic Imaging*, Jan. – Mar. 2006, Vol. 15, No. 1, Article 013019, pp 1 – 10. Erratum: 16(1), 019802:1 (Jan–Mar) 2007.
93. H. Alto, R.M. Rangayyan, and J.E.L. Desautels, "Content-based retrieval and analysis of mammographic masses," *Journal of Electronic Imaging*, 2005, Vol. 14, No. 2, Article 023016, pp 1 – 17. Erratum: 16(1), 019801:1 (Jan–Mar) 2007.
92. F.J. Ayres and R.M. Rangayyan, "Characterization of architectural distortion in mammograms using orientation fields," *Invited Paper, IEEE Engineering in Medicine and Biology*, January 2005, 24(1): 59 – 67.
91. R.J. Ferrari, R.M. Rangayyan, R.A. Borges, and A.F. Frère, "Segmentation of the fibro-glandular disc in mammograms via Gaussian mixture modelling," *Medical and Biological Engineering and Computing*, 42:378-387, 2004.
90. F.J. Ayres, M.K. Zuffo, R.M. Rangayyan, G.S. Boag, V. Odone Filho, and M. Valente, "Analysis of the tissue composition of the tumor mass in neuroblastoma using segmented CT images," *Medical and Biological Engineering and Computing*, 42:366-377, 2004.
89. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, R.A. Borges, and A.F. Frère, "Identification of the breast boundary in mammograms using active contour models," *Medical and Biological Engineering and Computing*, 42: 201 – 208, 2004.
88. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, R.A. Borges, and A.F. Frère, "Automatic identification of the pectoral muscle in mammograms," *IEEE Transactions on Medical Imaging*, 23(2): 232-245, 2004.
87. H. Alto, R.M. Rangayyan, R.B. Paranjape, J.E.L. Desautels, and H. Bryant "An indexed atlas of digital mammograms for computer-aided diagnosis of breast cancer," *Annales des Télécommunications*, 58(5-6):820-835, 2003.
86. D. Guliato, R.M. Rangayyan, W.A. Carnielli, J.A. Zuffo, and J.E.L. Desautels, 2003, "Fuzzy fusion operators to combine results of complementary medical image segmentation techniques," *Journal of Electronic Imaging*, 12(3): 379-389, July 2003.
85. D. Guliato, R.M. Rangayyan, W.A. Carnielli, J.A. Zuffo, and J.E.L. Desautels, 2003, "Segmentation of breast tumors in mammograms using fuzzy sets," *Journal of Electronic Imaging*, 12(3): 369-378, July 2003.
84. R.D. Lopes and R.M. Rangayyan, 2002, "Three-dimensional region-based filters for noise removal in volumetric data," *IETE Journal of Research*, India. 48(3&4): 325-332.
83. A.C.G. Martins and R.M. Rangayyan, 2002, "Texture element extraction via cepstral filtering in the Radon domain," *IETE Journal of Research*, India. Invited Paper. 48(3&4): 143-150.
82. N.R. Mudigonda, R.M. Rangayyan, and J.E.L. Desautels, 2001, "Detection of breast masses in mammograms by density slicing and texture flow-field analysis," *IEEE Transactions on Medical Imaging*, 20(12):1215-1227.
81. S. Krishnan, R.M. Rangayyan, G.D. Bell, and C.B. Frank, 2001, "Auditory display of knee-joint vibration signals," *Journal of the Acoustical Society of America*, 110(6):3292-3304.
80. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, and A.F. Frère, 2001, "Analysis of asymmetry in mammograms via directional filtering with Gabor wavelets," *IEEE Transactions on Medical Imaging*, 20(9):953-964.
79. A.C.G. Martins, R.M. Rangayyan, and R.A. Ruschioni, 2001, "Auditory display and sonification of texture in images," *Journal of Electronic Imaging*, 10(3): 690-705.

78. C. Serrano, B. Acha, R.M. Rangayyan, and L.M. Roa, 2001, "Segmentation-based lossless compression of burn wound images," *Journal of Electronic Imaging*, 10(3): 720-726.
77. R.M. Rangayyan, H. Alto, D. Gavrilov, 2001, "Parallel implementation of the adaptive neighborhood contrast enhancement technique using histogram-based image partitioning" *Journal of Electronic Imaging (Invited Paper)*, 10(3): 804-813.
76. R.M. Rangayyan and S. Krishnan, 2001, "Feature identification in the time-frequency plane by using the Hough-Radon transform," *Pattern Recognition*, 34:1147-1158.
75. V. Buzuloiu, M. Ciuc, R.M. Rangayyan, and C. Vertan, 2001, "Adaptive-neighborhood histogram equalization of color images," *Journal of Electronic Imaging*, 10(2): 445-459.
74. N.R. Mudigonda, R.M. Rangayyan, and J.E.L. Desautels, 2000, "Gradient and texture analysis for the classification of mammographic masses," *IEEE Transactions on Medical Imaging*, 19(10):1032-1043.
73. R.M. Rangayyan, N.R. Mudigonda, and J.E.L. Desautels, 2000, "Boundary modeling and shape analysis methods for classification of mammographic masses," *Medical and Biological Engineering and Computing*, 38(5):487-496.
72. M. Ciuc, R.M. Rangayyan, T. Zaharia, and V. Buzuloiu, 2000, "Filtering noise in color images using adaptive-neighborhood statistics," *Journal of Electronic Imaging*, 9(4):484-494.
71. S. Krishnan, R.M. Rangayyan, G.D. Bell, C.B. Frank, 2000, "Adaptive time-frequency analysis of knee joint vibroarthrographic signals for noninvasive screening of articular cartilage pathology," *IEEE Transactions on Biomedical Engineering*, 47(6):773-783, June 2000.
70. S. Krishnan and R.M. Rangayyan, 2000, "Automatic denoising of knee joint vibration signals using adaptive time-frequency representations," *Medical and Biological Engineering and Computing*, 38(1):2-8, January 2000.
69. B. Acha, C. Serrano, R.M. Rangayyan, and L.M. Roa, 1999, "Lossless compression algorithm for colour images," *Electronics Letters*, 4 Feb. 1999, 35(3):214-215.
68. R.M. Rangayyan, M. Ciuc, F. Faghih, 1998, "Adaptive neighborhood filtering of images corrupted by signal-dependent noise," *Applied Optics*, 37(20):4477-4487, 10 July 1998.
67. R.M. Rangayyan and W.A. Rolston, 1998, "Directional image analysis with the Hough and Radon transforms," *Journal of the Indian Institute of Science (Invited Paper)*, 78:3-16, 1998.
66. R.M. Rangayyan and A. Das, 1998, "Image enhancement based on edge profile acutance," *Journal of the Indian Institute of Science (Invited Paper)*, 78:17-29, 1998.
65. R.M. Rangayyan and A. Das, 1998, "Filtering multiplicative noise in images using adaptive region-based statistics," *Journal of Electronic Imaging*, 7(1):222-230.
64. O. Menut, R.M. Rangayyan, and J.E.L. Desautels, 1997, "Parabolic modeling and classification of breast tumors," *International Journal of Shape Modeling*, volume 3, numbers 3 and 4, pp155-166, September - December 1997.
63. R.M. Rangayyan, N.M. El-Faramawy, J.E.L. Desautels, and O.A. Alim, 1997, "Measures of acutance and shape for classification of breast tumors" *IEEE Transactions on Medical Imaging*, 16(6):799-810 (December 1997).
62. A.C.G. Martins and R.M. Rangayyan, 1997, "Complex cepstral filtering of images and echo removal in the Radon domain," *Pattern Recognition*, 30(11): 1931-1938 (November 1997)
61. R.M. Rangayyan, S. Krishnan, G.D. Bell, C.B. Frank, and K.O. Ladly, 1997, "Parametric representation and screening of knee joint vibroarthrographic signals," *IEEE Transactions on Biomedical Engineering*, 44(11): 1068-1074.
60. S. Krishnan, R.M. Rangayyan, G.D. Bell, C.B. Frank, and K.O. Ladly, 1997, "Adaptive filtering, modeling, and classification of knee joint vibroarthrographic signals for non-invasive diagnosis of articular cartilage pathology," *Medical and Biological Engineering and Computing*, 35(6):677-684, 1997.

59. R.M. Rangayyan, D. Boulfelfel, L.J. Hahn, and R. Kloiber, 1997, "Two-dimensional and three-dimensional restoration of SPECT images," *Medical and Life Sciences Engineering (Special Issue on Medical Imaging)* vol. 14, pp 82-94, 1997.
58. R.M. Rangayyan, R.B. Paranjape, L. Shen, and J.E.L. Desautels, 1997, "Computer-based enhancement and analysis of mammograms," *Medical and Life Sciences Engineering (Special Issue on Medical Imaging)* vol. 14, pp 29-39, 1997.
57. R.M. Rangayyan, L. Shen, Y. Shen, J.E.L. Desautels, H. Bryant, T.J. Terry, N. Horeczko, and M.S. Rose, 1997, "Improvement of sensitivity of breast cancer diagnosis with adaptive neighborhood contrast enhancement of mammograms," *IEEE Transactions on Information Technology in Biomedicine*, 1(3):161-170, Sept. 1997.
56. L. Shen and R.M. Rangayyan, 1997, "A segmentation-based lossless image coding method for compression of high-resolution medical images," *IEEE Transactions on Medical Imaging*, 16(3):301-307, 1997.
55. L. Shen and R.M. Rangayyan, 1997, "Lossless compression of continuous-tone images by combined inter-bit-plane decorrelation and JBIG coding" *Journal of Electronic Imaging*, 6(2):198-207, 1997.
54. R.C. Bray, R.M. Rangayyan, and C.B. Frank, 1996, "Normal and healing ligament vascularity: A quantitative histological assessment in the adult rabbit medial collateral ligament," *Journal of Anatomy*, 188:87-95, 1996.
53. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1996, "Relationships of the vibromyogram to the surface electromyogram of the human rectus femoris muscle during voluntary isometric contraction," *Journal of Rehabilitation Research and Development*, vol. 33, No. 4, pp 395-403, October 1996.
52. Z.M.K. Moussavi, R.M. Rangayyan, G.D. Bell, C.B. Frank, K.O. Ladly, and Y.T. Zhang, 1996, "Screening of vibroarthrographic signals via adaptive segmentation and linear prediction modeling," *IEEE Transactions on Biomedical Engineering*, 43(1):15-23, January 1996.
51. Y. Shen, R.M. Rangayyan, G.D. Bell, C.B. Frank, Y.T. Zhang, and K.O. Ladly, 1995, "Localization of knee joint cartilage pathology by multichannel vibroarthrography," *Medical Engineering and Physics*, 17(8):583-594, December 1995.
50. R.M. Rangayyan and S. Elkadiki, 1995, "A region-based algorithm for the computation of image edge profile acutance," *Journal of Electronic Imaging*, 4(1): 62-70, January 1995.
49. R.B. Paranjape, R.M. Rangayyan, and W.M. Morrow, 1994, "Adaptive neighbourhood mean and median image filtering," *Journal of Electronic Imaging*, 3(4): 360-367, October 1994.
48. T.F. Rabie, R.M. Rangayyan, and R.B. Paranjape, 1994, "Adaptive-neighborhood image deblurring," *Journal of Electronic Imaging*, 3(4): 368-378, October 1994.
47. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1994, "Three-dimensional restoration of single photon emission computed tomography images," *IEEE Transactions on Nuclear Science*, 41(5): 1746-1754, October 1994.
46. T.F. Rabie, R.B. Paranjape, and R.M. Rangayyan, 1994, "An iterative method for blind deconvolution," *Journal of Electronic Imaging*, 3(3): 245-250, July 1994.
45. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1994, "Application of shape analysis to mammographic calcifications" *IEEE Transactions on Medical Imaging*, 13(2): 263-274, June 1994.
44. R.B. Paranjape, T.F. Rabie, and R.M. Rangayyan, 1994, "Image restoration by adaptive neighborhood noise subtraction," *Applied Optics*, 33 (14): 2861-2869, 10 May 1994.
43. J.A. Provine and R.M. Rangayyan, 1994, "Lossless compression of Peanoscaned images," *Journal of Electronic Imaging*, 3(2): 176-181, April 1994.
42. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, R. Kloiber, and G.R. Kuduvalli, 1994, "Restoration of single photon emission computed tomography images by the Kalman filter" *IEEE Transactions on Medical Imaging*, 13(1): 102-109, March 1994.
41. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1994, "Adaptive cancellation of muscle contraction interference in vibroarthrographic signals," *IEEE Transactions on Biomedical Engineering*, 41(2): 181-191, February 1994.

40. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1994, "Vibroarthrographic (VAG) signal analysis for noninvasive diagnosis of knee joint disorders," Medical and Life Sciences Engineering (Special Issue on Biomedical Signal Processing), 13: 146-160, January 1994.
39. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1993, "Detection and classification of mammographic calcifications," Invited paper, International Journal of Pattern Recognition and Artificial Intelligence, vol. 7, no. 6, pp 1403-1416.
38. K.O. Ladly, C.B. Frank, G.D. Bell, Y.T. Zhang, and R.M. Rangayyan, 1993, "The effect of external loads and cyclic loading on normal patellofemoral joint signals," Invited Paper, Special Issue on Biomedical Engineering, Defence Science Journal (India), 43: 201-210, July 1993.
37. G.R. Kuduvalli and R.M. Rangayyan, 1993, "An algorithm for direct computation of 2-D linear prediction coefficients," IEEE Transactions on Signal Processing (Correspondence), vol. 41, pp 996-1000, Feb. 1993.
36. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1992, "Use of the geometric mean of opposing planar projections in pre-reconstruction restoration of SPECT images," Physics in Medicine and Biology, 37 (10): 1915-1929, 1992.
35. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1992, "A comparative study of simultaneous vibromyography and electromyography with active human quadriceps" IEEE Transactions on Biomedical Engineering, 39(9): 1045-1052, October 1992.
34. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1992, "Mathematical modelling and spectrum analysis of the physiological patello-femoral pulse train produced by slow knee movement," IEEE Transactions on Biomedical Engineering, 39(9):971-979.
33. S. Tavathia, R.M. Rangayyan, C.B. Frank, G.D. Bell, K.O. Ladly, and Y.T. Zhang, 1992, "Analysis of knee vibration signals using linear prediction," IEEE Transactions on Biomedical Engineering, 39(9): 959-970.
32. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1992, "Pre-reconstruction restoration of single photon emission computed tomography images," IEEE Transactions on Medical Imaging, vol. 11, no. 3, pp 336-341, Sept. 1992.
31. W.M. Morrow, R.B. Paranjape, R.M. Rangayyan, and J.E.L. Desautels, 1992, "Region-based contrast enhancement of mammograms" IEEE Transactions on Medical Imaging, vol. 11, no. 3, pp 392-406, Sept. 1992.
30. G.R. Kuduvalli and R.M. Rangayyan, 1992, "Performance analysis of reversible image compression techniques for high-resolution digital teleradiology" IEEE Transactions on Medical Imaging, vol. 11, no. 3, pp 430-445, Sept. 1992.
29. R.B. Paranjape, W.M. Morrow, and R.M. Rangayyan, 1992, "Adaptive neighborhood histogram equalization for image enhancement," CVGIP: Graphical Models and Image Processing, vol. 54, no. 3, pp 259-267, May 1992 (Research Note).
28. C. Frank, D. McDonald, D. Bray, R. Bray, R. Rangayyan, D. Chimich, and N. Shrive, 1992, "Collagen fibril diameters in the healing adult rabbit medial collateral ligament," Connective Tissue Research, vol. 27, pp251-263.
27. K. Eng, R.M. Rangayyan, R.C. Bray, C.B. Frank, L. Anscumb, and P. Veale, 1992, "Quantitative analysis of the fine vascular anatomy of articular ligaments," IEEE Transactions on Biomedical Engineering, vol. 39, March 1992, pp 296-306.
26. G.R. Kuduvalli, R.M. Rangayyan, and J.E.L. Desautels, 1991, "High-resolution digital teleradiology: A perspective," Journal of Digital Imaging, Vol. 4, No. 4, Nov. 1991, pp 251-261.
25. Z.-Q. Liu, R.M. Rangayyan and C.B. Frank, 1991, "Directional Analysis of Images in Scale-space," IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 13, no. 11, Nov. 1991, pp 1185-1192.
24. Z.-Q. Liu, R.M. Rangayyan, and C.B. Frank, 1991, "Statistical analysis of collagen alignment in ligaments by scale-space analysis," IEEE Transactions on Biomedical Engineering, Vol. 38, No. 6, June 1991, pp 580-588.
23. C. Frank, B. MacFarlane, P. Edwards, R. Rangayyan, Z.-Q. Liu, S. Walsh, and R. Bray, 1991, "A quantitative analysis of matrix alignment in ligament scars: A comparison of movement versus immobilization in an immature rabbit model," Journal of Orthopaedic Research, vol. 9, no. 2, pp. 219-227, 1991.

22. C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1990, "Analysis of knee joint sound signals for non-invasive diagnosis of cartilage pathology," *IEEE Engineering in Medicine and Biology*, March 1990, pp 65-68.
21. T.C. Hon, R.M. Rangayyan, L.J. Hahn and R. Kloiber, 1989, "Restoration of Gamma Camera-Based Nuclear Medical Images," *IEEE Transactions on Medical Imaging*, vol. 8, pp 354-363.
20. C. Frank, D. Bray, A Rademaker, C. Chrusch, P. Sabiston, D. Bodie and R.M. Rangayyan, 1989, "Electron microscopic quantification of collagen fibril diameters in the rabbit medial collateral ligament: A baseline for comparison," *Connective Tissue Research*, Vol. 19, pp 11-25.
19. R.M. Rangayyan and R.J. Lehner, 1988, "Phonocardiogram signal processing: A review," *CRC Critical Reviews in Biomedical Engg.*, Vol. 15, Issue 3, pp. 211 - 236.
18. A.L. Kok, J.A.R. Blais, and R.M. Rangayyan, 1987, "Filtering of digitally correlated Gestalt elevation data," *Photogrammetric Engineering and Remote Sensing*, Vol. 53, pp. 535-538.
17. S. Chaudhuri, H. Nguyen, R.M. Rangayyan, S. Walsh and C.B. Frank, 1987, "A Fourier domain directional filtering method for analysis of collagen alignment in ligaments," *IEEE Transactions on Biomedical Engineering*, Vol. BME-34, pp. 509-518.
16. R.J. Lehner and R.M. Rangayyan, 1987, "A three-channel microcomputer system for segmentation and characterization of the phonocardiogram," *IEEE Transactions on Biomedical Engineering*, Vol. BME-34, pp. 485-489 (communication).
15. R.M. Rangayyan, 1986, "Computed tomography techniques and algorithms: A tutorial," *Innovation et Technologie en Biologie et Medecine*, Vol. 7, No. 6, pp. 745-762.
14. R.M. Rangayyan, R. Gordon, and A.P. Dhawan, 1985, "Algorithms for limited-view computed tomography: An annotated bibliography and a challenge," *Applied Optics*, Vol. 24, #23, 1 December 1985, pp. 4000-4012.
13. A.P. Dhawan, R.M. Rangayyan, and R. Gordon, 1985, "Image restoration by Wiener deconvolution in limited-view computed tomography," *Applied Optics*, Vol. 24, #23, 1 Dec. 1985, pp. 4013-4020.
12. K. Jaman, R. Gordon and R.M. Rangayyan, 1985, "Display of 3-D anisotropic data from limited-view computed tomograms," *Computer Vision, Graphics and Image Processing*, Vol. 30, pp. 345-361.
11. P.J. Soble, R.M. Rangayyan and R. Gordon, 1985, "Quantitative and qualitative evaluation of geometric deconvolution of distortion in limited-view computed tomography," *IEEE Transactions on Biomedical Engineering*, Vol. BME-32, pp. 330-335.
10. R.M. Rangayyan and R. Gordon, 1984, "Expanding the dynamic range of x-ray video-densitometry using ordinary image digitizing devices," *Applied Optics*, Vol. 23, pp. 3117 - 3120. (15 September, 1984).
9. A.P. Dhawan, R. Gordon and R.M. Rangayyan, 1984, "Nevoscopy: 3-D computed tomography of nevi and melanoma in situ by transillumination," *IEEE Transactions on Medical Imaging*, Vol. MI-3, pp. 54-61.
8. R. Gordon and R.M. Rangayyan, 1984, "Feature enhancement of mammograms using fixed and adaptive neighborhoods," *Applied Optics*, Vol. 23, No. 4, 15 Feb. 1984, pp. 560-564.
7. R.M. Rangayyan and R. Gordon, 1983, "Computed tomography from ordinary radiographs for teleradiology," *Medical Physics*, Vol. 10, pp. 687-690 (Technical Note).
6. R. Gordon and R.M. Rangayyan, 1983, "Geometric deconvolution: A meta-algorithm for limited view computed tomography," *IEEE Transactions on Biomedical Engineering*, Vol. BME-30, pp. 806-810.
5. R.M. Rangayyan and R. Gordon, 1982, "Streak preventive image reconstruction via ART and adaptive filtering," *IEEE Transactions on Medical Imaging*, Vol. MI-1, pp. 173-178.
4. I.S.N. Murthy and R.M. Rangayyan (M.R. Rangaraj), 1979, "New concepts for PVC detection," *IEEE Transactions on Biomedical Engineering*, Vol. BME-26, pp. 409-416.

3. I.S.N. Murthy, R.M. Rangayyan (M.R. Rangaraj), K.J. Udupa and A.K. Goyal, 1979, "Homomorphic analysis and modelling of ECG signals," IEEE Transactions on Biomedical Engineering, Vol. BME-26, pp. 330-344.
2. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1979, "Quantitative analysis of the phonocardiogram for detection of murmurs," Journal of Biomedical Engineering, Vol. 1, pp. 247-252. (communication).
1. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1979, "New techniques for phonocardiogram analysis," Medical and Life Sciences Engineering, Vol. 5, pp. 6-17.

B. Abstracts and Letters in Journals

2. R. Gordon, A.P. Dhawan and R.M. Rangayyan, 1985, "Reply to Comments on Geometric Deconvolution: A Meta-Algorithm for Limited View Computed Tomography," IEEE Transactions on Biomedical Engineering, Vol. 32, pp. 242-244.
1. R. Gordon, A.P. Dhawan and R.M. Rangayyan, 1984, "Image restoration in limited-view CT," Radiology, Vol. 153(P), p. 369.

C. Books Authored

14. P. Casti, A. Mencattini, M. Salmeri, R. M. Rangayyan, "Computerized Analysis of Mammographic Images for Detection and Characterization of Breast Cancer," Morgan & Claypool, Jun. 2017, 186 pages, <https://doi.org/10.2200/S00776ED1V01Y201704BME056>.
13. R.M. Rangayyan, "Biomedical Signal Analysis," Second Edition, IEEE Press and Wiley, New York, NY. 2015. 672 pages. ISBN 9780470911396.
12. F. Oloumi, R. M. Rangayyan, and A. L. Ells, "Digital Image Processing for Ophthalmology: Detection and Modeling of Retinal Vascular Architecture," Morgan & Claypool, Jan. 2014, 185 pages, ISBN: 9781627054300 paperback. ISBN: 9781627054317 ebook. DOI 10.2200/S00569ED1V01Y201402BME049.
11. D. Frey, V.A. Coelho, and R.M. Rangayyan, "Acoustical Impulse Response Functions of Music Performance Halls," 110 pages, Morgan & Claypool, 2013. ISBN: 9781627051873 paperback, ISBN: 9781627051880 ebook, DOI 10.2200/S00488ED1V01Y201303SAP012
10. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Computer-aided Detection of Architectural Distortion in Prior Mammograms of Interval Cancer," 193 pages, 2013, Morgan & Claypool. ISBN: 9781627050821 paperback. ISBN: 9781627050838 ebook. DOI 10.2200/S00463ED1V01Y201212BME047
9. P. M. de Azevedo-Marques and R. M. Rangayyan, "Content-based Retrieval of Medical Images: Landmarking, Indexing, and Relevance Feedback," Morgan & Claypool. 143 pages. 2013. ISBN: 9781627051415 paperback. ISBN: 9781627051422 ebook. DOI 10.2200/S00469ED1V01Y201301BME048
8. T. M. Cabral and R. M. Rangayyan, "Fractal Analysis of Breast Masses in Mammograms," Morgan & Claypool. 2012. 118 pages. ISBN: 9781627050685 paperback. ISBN: 9781627050692 ebook. DOI 10.2200/S00453ED1V01Y201210BME046
7. R. M. Rangayyan, B. Acha, and C. Serrano, "Color Image Processing with Biomedical Applications," SPIE Press, Bellingham, WA, 434 pages, ISBN: 9780819485649, 2011.
6. D. Guliato and R.M. Rangayyan, "Modeling and Analysis of Shape with Applications in Computer-Aided Diagnosis of Breast Cancer," Morgan & Claypool. 2011. 95 pages. ISBN: 9781608450329 paperback. ISBN: 9781608450336 ebook. DOI 10.2200/S00325ED1V01Y201012BME039
5. X. Zhu, R.M. Rangayyan, and A.L. Ells, "Digital Image Processing for Ophthalmology: Detection of the Optic Nerve Head," Morgan & Claypool. 2011. 106 pages. ISBN: 9781608456314 paperback. ISBN: 9781608456321 ebook. DOI 10.2200/S00335ED1V01Y201102BME040
4. F.J. Ayres, R.M. Rangayyan, and J.E.L. Desautels, "Analysis of Oriented Texture: with Applications to the Detection of Architectural Distortion in Mammograms," Morgan & Claypool. 2011. 166 pages. ISBN: 9781608450299 paperback. ISBN: 9781608450305 ebook. DOI 10.2200/S00301ED1V01Y201010BME038

3. S. Banik, R.M. Rangayyan, and G.S. Boag, "Landmarking and Segmentation of 3D CT Images." Morgan & Claypool. 2009. 148 pages. ISBN: 9781598292848 paperback. ISBN: 9781598292855 ebook. DOI 10.2200/S00185ED1V01Y200903BME030.
2. R.M. Rangayyan, "Biomedical Image Analysis," CRC Press, Boca Raton, FL. 1,306 pages. 2005. ISBN 0-8493-9695-6.
1. R.M. Rangayyan, "Biomedical Signal Analysis: A Case-Study Approach," IEEE Press and Wiley, New York, NY. 2002. 516 pages. ISBN 0-471-20811-6.
- 1a. Paperback edition published by John Wiley & Sons (ASIA) Pte Ltd, Singapore. 2002. ISBN 9814-12-611-X.
- 1b. Russian translation by A. Kalinichenko, 2007, Physmathlit, Moscow, Russia. ISBN 978-5-9221-0730-3.

D. Books Edited/ Conference Proceedings Edited/ Journal Issues Edited

16. P.M. Azevedo-Marques, A. Mencattini, M. Salmeri, R.M. Rangayyan, Editors, "Medical Image Analysis and Informatics: Computer-Aided Diagnosis and Therapy," 2018, CRC Press, Boca Raton, FL, 21 Chapters, 518 Pages, ISBN 9781498753197.
15. E.Y.K. Ng, U. R. Acharya, R.M. Rangayyan, and J.S. Suri, Editors, "Ophthalmological Imaging and Applications," 24 chapters, 529 pages, CRC Press, Boca Raton, FL, 2014, ISBN 9781466559134.
14. E. Y. K. Ng, U. R. Acharya, R. M. Rangayyan, and J. S. Suri, Editors, "Multimodality Breast Imaging: Diagnosis and Treatment," 2013, 572 pages, ISBN: 9780819492944, SPIE Press Volume: PM227. 18 chapters.
13. J.S. Suri, S.V. Sree, K.H. Ng, and R.M. Rangayyan, Editors, "Diagnostic and Therapeutic Applications of Breast Imaging," SPIE Press, Bellingham, WA, 2012. 14 chapters, 542 pages.
12. J. Tang, R. M. Rangayyan, J. Yao, Y. Yang, Editors, Special issue of IEEE Journal of Selected Topics in Signal Processing, Vol. 3, No. 1, February 2009, on "Digital image processing and pattern recognition techniques for the detection of cancer." Editorial: doi: 10.1109/JSTSP.2009.2013533. pp 1-3. 18 articles, 187 pages.
11. J. Tang, R. M. Rangayyan, J. Yao, Y. Yang, Editors, Special issue of Pattern Recognition on "Digital image processing and pattern recognition techniques for the detection of cancer," June 2009. Editorial: doi:10.1016/j.patcog.2008.11.012. vol. 42, no. 6, pp 1015-1016. 18 articles, 178 pages.
10. J. S. Suri, R. M. Rangayyan, and S. Laxminarayan, Editors, "Emerging Technologies in Breast Imaging and Mammography," American Scientific Publishers, Stevenson Ranch, CA, 2008, 27 chapters, 536 pages.
9. A. K. Nandi and R.M. Rangayyan, Editors, "Medical Applications of Signal Processing," Special Issue of the Journal of the Franklin Institute, 2007, Vol. 344, Issue 3-4, nine articles, 194 pages.
8. J. S. Suri and R. M. Rangayyan, Editors, "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," SPIE Press, Bellingham, WA, 2006, 28 chapters, 972 pages.
7. P. Jennett and R.M. Rangayyan, Editors, Proceedings of the IASTED International Conference on Telehealth, Banff, Alberta, Canada, July 2005, 182 pages.
6. R.M. Rangayyan, Section Editor, "Enhancement," pp 1-65, in "Handbook of Medical Image Processing," I.N. Bankman, Editor, Academic Press, San Diego, CA, 2000.
5. R.M. Rangayyan, Editor, "Medical Imaging and Image Processing," Special Issue of the journal Medical and Life Sciences Engineering, published by the Biomedical Engineering Society of India, vol. 14, 1997.
4. R.M. Rangayyan, Editor, "Biomedical Signal Processing," Special Issue of the journal Medical and Life Sciences Engineering, published by the Biomedical Engineering Society of India, vol. 13, 1994.
3. A.Y.J. Szeto and R.M. Rangayyan, Editors, Proceedings of the 15th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, October 28-31, 1993, San Diego, CA, USA, 1626 pages, about 840 papers.
2. R.M. Rangayyan, Editor, Proceedings of the IEEE Western Canada Conference and Exhibition on Telecommunication for Health Care: Telemetry, Teleradiology, and Telemedicine, July 6-7, 1990, Calgary, Canada, Proc. SPIE Vol. 1355.

1. R.M. Rangayyan, Associate Editor: IEEE Transactions on Biomedical Engineering, 1989-96.

E. Chapters/ Sections in Books

25. A. Mencattini, P. Casti, M. Salmeri, and R. M. Rangayyan, "Computerized detection of bilateral asymmetry," Chapter 10, pp 219-239, in P.M. Azevedo-Marques, A. Mencattini, M. Salmeri, R.M. Rangayyan, Editors, "Medical Image Analysis and Informatics: Computer-Aided Diagnosis and Therapy," 2018, CRC Press, Boca Raton, FL.
24. F. Oloumi, R. M. Rangayyan, and A. L. Ells, "Computer-aided Diagnosis of Retinopathy of Prematurity in Retinal Fundus Images," Chapter 3, pp 57-83, in P.M. Azevedo-Marques, A. Mencattini, M. Salmeri, R.M. Rangayyan, Editors, "Medical Image Analysis and Informatics: Computer-Aided Diagnosis and Therapy," 2018, CRC Press, Boca Raton, FL.
23. P.M. Azevedo-Marques, A. Mencattini, M. Salmeri, R.M. Rangayyan, "Preface," pp xv-xx, and "Concluding Remarks," pp 505-507, in P.M. Azevedo-Marques, A. Mencattini, M. Salmeri, R.M. Rangayyan, Editors, "Medical Image Analysis and Informatics: Computer-Aided Diagnosis and Therapy," 2018, CRC Press, Boca Raton, FL.
22. F. Oloumi, R. M. Rangayyan, and A. L. Ells, "Detection, Modeling, and Analysis of Retinal Vascular Architecture in Fundus Images," Chapter 2 in E.Y.K. Ng, U. R. Acharya, R.M. Rangayyan, and J.S. Suri, Editors, "Ophthalmological Imaging and Applications," CRC Press, Boca Raton, FL, pp21-52, 2014.
21. G. Raguso, A. Ancona, L. Chieppa, S. L'Abbate, M.L. Pepe, F. Mangieri, S. Banik, and R.M. Rangayyan, "Analysis of Breast Masses in Mammograms Using the Fractal Dimension and Shape Factors," Chapter 10, pp269-294, in Computer-Aided Cancer Detection and Diagnosis: Recent Advances, Edited by J. Tang and S. Aghaian, SPIE, Bellingham, WA, 2014.
20. R. M. Rangayyan, S. Banik, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms using Statistical Measures of Angular Spread," Chapter 1, pp1-39, in E. Y. K. Ng, U. R. Acharya, R. M. Rangayyan, and J. S. Suri, "Multimodality Breast Imaging: Diagnosis and Treatment," 2013, ISBN: 9780819492944, SPIE Press Volume: PM227.
19. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Image Processing and Pattern Classification Techniques for the Detection of Architectural Distortion in Prior Mammograms of Interval-cancer Cases, Chapter 6 in "Diagnostic and Therapeutic Applications of Breast Imaging," J.S. Suri, S.V. Sree, K.H. Ng, and R.M. Rangayyan, Editors, 2012, SPIE Press, Bellingham, WA, pp 197-242.
18. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Digital Image Processing and Machine Learning Techniques for the Detection of Architectural Distortion in Prior Mammograms, Chapter 2 in "Machine Learning in Computer-Aided Diagnosis: Medical Imaging Intelligence and Analysis," pp 23-65, Editor: K. Suzuki, IGI Global, Hershey, PA, 2012.
17. Y.F. Wu and R.M. Rangayyan, "Noise Cancellation in ECG Signals with an Unbiased Adaptive Filter," Chapter 22 in "Transdisciplinary Advancements in Cognitive Mechanisms and Human Information Processing," Ed. Y. Wang, Information Science Reference, an imprint of IGI Global, Hershey, PA, pp 348-366, 2011. DOI: 10.4018/978-1-60960-553-7.ch022
16. R.M. Rangayyan, F.J. Ayres, Faraz Oloumi, Foad Oloumi, and P. Eshghzadeh-Zanjani, "Detection of Retinal Blood Vessels using Gabor Filters," Chapter 10 in "Image Modeling of the Human Eye," pp 215-227, Edited by Rajendra Acharya U., E.Y. K. Ng, J.S. Suri, Artech House, Norwood, MA, 2008.
15. F.J. Ayres and R.M. Rangayyan, "Characterization and detection of architectural distortion in mammograms using orientation fields and phase portraits," Chapter 25 in "Emerging Technologies in Breast Imaging and Mammography," Edited by J. S. Suri, R. M. Rangayyan, and S. Laxminarayan, American Scientific Publishers, Stevenson Ranch, CA, 2008, pp 471 – 482.
14. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, A.F. Frère, and R.A. Borges, "Detection of the breast contour in mammograms by using active contour models," Chapter 5 in Volume I of "Deformable Models: Biomedical and Clinical Applications," Edited by J.S. Suri and A.A. Farag, Springer, New York, NY, 2007, pp 133 – 162.
13. J. S. Suri, R. Chandrasekhar, N. Lanconelli, R. Campanini, M. Roffilli, R.-F. Chang, Y. Guo, R. Sivaramakrishna, T. Tot, B. Acha, C. Serrano, I. Reiser, R. M. Nishikawa, D. H. Wu, K.-P. Wong, A. Kshirsagar, Y. Sun, M. Wirth, A. Cao, J. E. L. Desautels, and R. M. Rangayyan, "The current status and likely future of breast imaging CAD," Chapter 28, in "Recent

Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 901 – 961.

12. Y. Sun, J. S. Suri, R. M. Rangayyan, and J. E. L. Desautels, "New approach for breast skin-line estimation in mammograms," Chapter 11, in "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 377 – 408.

11. H. Alto, R.M. Rangayyan, R.B. Paranjape, J.E.L. Desautels, and H. Bryant, "An indexed atlas of digital mammograms for computer-aided diagnosis of breast cancer," Chapter 3, in "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 109 – 127.

10. D. Guliato, E. V. de Melo, R. S. Bôaventura, and R.M. Rangayyan, "AMDI – Indexed atlas of digital mammograms that integrates case studies, e-learning, and research systems via the Web," Chapter 15, in "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 529 – 555.

9. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, and A.F. Frère, "Analysis of bilateral asymmetry in mammograms via directional filtering with Gabor wavelets," Chapter 6, in "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 197 – 228.

8. B. Acha, C. Serrano, R.M. Rangayyan, and J.E.L. Desautels, "Detection of microcalcifications in mammograms," Chapter 9, in "Recent Advances in Breast Imaging, Mammography, and Computer-aided Diagnosis of Breast Cancer," Edited by J. S. Suri and R. M. Rangayyan, SPIE Press, Bellingham, WA, 2006, pp 291 – 314.

7. D. Guliato and R.M. Rangayyan, "Fuzzy region growing and fusion methods for the segmentation of masses in mammograms," in "Medical Imaging Systems Technology: Methods in Diagnosis Optimization," Ed. C.T. Leondes, World Scientific, Singapore, 2005, Chapter 3, pp 67 – 109.

6. R.M. Rangayyan, L. Shen, Y. Shen, J.E.L. Desautels, H. Bryant, T.J. Terry, N. Horeczko, and M.S. Rose, 2002, "Region-based adaptive contrast enhancement," chapter in the book "Image-processing techniques for tumor detection," Edited by R.N. Strickland, Marcel Dekker, New York, NY, pp 213-242.

5. R.M. Rangayyan and A. Kantzas, 2000, "Image reconstruction," Wiley Encyclopedia of Electrical and Electronics Engineering, Supplement 1, Editor: John G. Webster, Wiley, New York, NY, pp 249-268.

4. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1994, "Detection and classification of mammographic calcifications," chapter in book, "State of the Art in Digital Mammographic Image Analysis" (in Series on Machine Perception and Artificial Intelligence), Editors: K.W. Bowyer and S. Astley, World Scientific Publishing Co., River Edge, NJ, pp 198-212.

3. Our work on adaptive neighbourhood image processing has been discussed in detail in the book by M. Sonka, V. Hlavac, and R. Boyle, "Image Processing, Analysis, and Machine Vision," Chapman and Hall, London, U.K., 1993, Section 4.3.8 "Adaptive neighborhood pre-processing," pp 96-102.

2. Our work on knee joint vibration signals has been featured in the book by M. Akay, "Biomedical Signal Processing," Academic Press, San Diego, 1993, Section 10.6.2, "AR modeling of knee vibration sound signals," pp 210-222.

1. Our work on homomorphic analysis of electrocardiographic signals has been featured in detail in the book by M. Akay, "Biomedical Signal Processing," Academic Press, San Diego, 1993, Section 6.4.1, "Analysis of the ECG signal using cepstrum techniques," pp 123-130.

F. Papers in Refereed Conference Proceedings

276. I. Cardoso, E. Almeida, H. Allende-Cid, A. C. Frery, R. M. Rangayyan, P. M. Azevedo-Marques, H. S. Ramos, "Evaluation of Deep Feedforward Neural Networks for Classification of Diffuse Lung Diseases," Iberoamerican Congress on Pattern Recognition, CIARP 2017: Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications, pp 152-159, Springer Lecture Notes in Computer Science book series (LNCS, volume 10657), 7-10 November 2017, Valparaíso, Chile.

275. D. F. G. Coelho, R. M. Rangayyan, V. S. Dimitrov, "Detection of Neovascularization Near the Optic Disk Due to Diabetic Retinopathy," Proc. European Conference on Signal Processing EUSIPCO 2016, Budapest, Hungary, 29 August - 2 September 2016. pp 2040-2044.
274. L. Frighetto-Pereira, G. A. Metzner, P. M. Azevedo-Marques, M. H. Nogueira-Barbosa, F. Oloumi, R. M. Rangayyan, "Recognition of vertebral compression fractures in magnetic resonance images using measures of distances to the centroid," Proc. Computer Assisted Radiology and Surgery, Heidelberg, Germany, 21-25 June 2016.
273. L. Frighetto-Pereira, R. M. Rangayyan, G. A. Metzner, P. M. Azevedo-Marques, and M. H. Nogueira-Barbosa, "Recognition of vertebral compression fractures in magnetic resonance images using statistics of height and width," Proc. IEEE International Symposium on Medical Measurements and Applications, 15-18 May 2016, Benevento, Italy.
272. L. Frighetto-Pereira, R. Menezes-Reis, G. A. Metzner, R. M. Rangayyan, M. H. Nogueira-Barbosa, P. M. Azevedo-Marques, "Classification of vertebral compression fractures in magnetic resonance images using shape analysis," Proc. 5th IEEE International Conference on E-Health and Bioengineering, EHB 2015, Iași, Romania, November 19-21, 2015.
271. S. Mudigonda, F. Oloumi, K. M. Katta, and R. M. Rangayyan, "Fractal analysis of neovascularization due to diabetic retinopathy in retinal fundus images," Proc. 5th IEEE International Conference on E-Health and Bioengineering, EHB 2015, Iași, Romania, November 19-21, 2015.
270. F. Oloumi, R. M. Rangayyan, A. Ells, "Computer-aided Diagnosis of Plus Disease in Retinal Fundus Images of Preterm Infants via Measurement of Vessel Tortuosity," Proc. 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy, August 25-29, 2015.
269. E. Almeida, R.M. Rangayyan, and P.M. Azevedo-Marques, "Fuzzy Membership Functions for Analysis of High-Resolution CT Images of Diffuse Pulmonary Diseases," Proc. 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy, August 25-29, 2015.
268. P. M. Azevedo-Marques, H.F. Spagnoli, L. Frighetto-Pereira, R. Menezes-Reis, G.A. Metzner, R.M. Rangayyan, M. H. Nogueira-Barbosa, "Classification of Vertebral Compression Fractures in Magnetic Resonance Images using Spectral and Fractal Analysis," Proc. 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy, August 25-29, 2015.
267. L. Frighetto-Pereira, P. M. Azevedo-Marques, R. Menezes-Reis, G.A. Metzner, M. H. Nogueira-Barbosa, R.M. Rangayyan, "Semiautomatic classification of benign versus malignant vertebral compression fractures using texture and gray-level features in magnetic resonance images," Proc. 28th IEEE International Symposium on Computer-Based Medical Systems (CBMS 2015), São Carlos and Ribeirão Preto, SP, Brazil, June 22-25, 2015.
266. Y.F. Wu, X. Luo, P. Chen, L.F. Liao, S.S. Yang, and R.M. Rangayyan, "Forward Autoregressive Modeling for Stride Process Analysis in Patients with Idiopathic Parkinson's Disease," Proc. IEEE International Symposium on Medical Measurements and Applications, 7-9 May 2015, Torino, Italy.
265. E. Almeida, R.M. Rangayyan, and P.M. Azevedo-Marques, "Gaussian Mixture Modeling for Statistical Analysis of Features of High-Resolution CT Images of Diffuse Pulmonary Diseases," Proc. IEEE International Symposium on Medical Measurements and Applications, 7-9 May 2015, Torino, Italy. **Winner of Best Paper Award.**
264. A.K. Dhara, S. Mukhopadhyay, M.J. Bency, R.M. Rangayyan, R. Bansal, and A. Gupta, "Development of a Screening Tool for Staging of Diabetic Retinopathy in Fundus Images," Proc. SPIE Medical Imaging, Feb. 2015.
263. M. S. Barreiro, M. H. Nogueira-Barbosa, R. M. Rangayyan, R. M. Reis, J. R. G. Manzan, L. C. Pereyra and P. M. Azevedo-Marques, "Predição de Valores de Relaxometria T1 ρ de Discos Intervertebrais a Partir de Imagens Ponderadas em T2," XXIV Congresso Brasileiro de Engenharia Biomédica, October 2014, Uberlândia, MG, Brasil.
262. F. Oloumi, R. M. Rangayyan, A. Ells, "Assessment of Vessel Tortuosity in Retinal Images of Preterm Infants," Proc. 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Chicago, IL, August 2014.
261. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. Mangieri, and R.M. Rangayyan, "Development and Validation of a Fully Automated System for Detection and Diagnosis of Mammographic Lesions," Proc. 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Chicago, IL, August 2014.

260. P. Casti, A. Mencattini, M. Salmeri, and R.M. Rangayyan, "Spatial correlation analysis of mammograms for detection of asymmetric findings," Proc. 12th International Workshop on Breast Imaging, Gifu, Japan, June 2014. Springer Lecture Notes in Computer Science. H. Fujita, T. Hara, and C. Muramatsu (Editors): IWDM 2014, LNCS 8539, pp. 558–564, 2014.
259. P. Casti, A. Mencattini, M. Salmeri, and R.M. Rangayyan, "Semivariogram analysis and spherical modeling to detect structural bilateral asymmetry in mammograms," Proc. Computer Assisted Radiology and Surgery, Fukuoka, Japan, June 2014. International Journal of Computer Assisted Radiology and Surgery, Springer.
258. L.C. Pereyra, R.M. Rangayyan, M. Ponciano-Silva, P.M. Azevedo-Marques, "Fractal Analysis for Computer-aided Diagnosis of Diffuse Pulmonary Diseases in HRCT Images," Proc. IEEE International Symposium on Medical Measurements and Applications, June 2014, Lisbon, Portugal.
257. F. Oloumi, R. M. Rangayyan, A. Ells, "Measurement of Vessel Width in Retinal Fundus Images of Preterm Infants with Plus Disease," Proc. IEEE International Symposium on Medical Measurements and Applications, June 2014, Lisbon, Portugal.
256. M. Barreiro, M. Nogueira-Barbosa, R.M. Rangayyan, R. Reis, L. Pereyra, and P. M. Azevedo-Marques, "Semiautomatic Classification of Intervertebral Disc Degeneration In Magnetic Resonance Images of The Spine" IEEE 5th Biosignals and Biorobotics Conference, Salvador, Bahia, Brazil, May 2014.
255. F. Oloumi, R. M. Rangayyan, A. Ells, "Tracking the Major Temporal Arcade in Retinal Fundus Images," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, Toronto, ON, Canada, May 2014. **Winner of First Prize in Student Paper Competition.**
254. A.K. Dhara, R.M. Rangayyan, F. Oloumi, and S. Mukhopadhyay, "Methods for the Detection of Blood Vessels in Retinal Fundus Images and Reduction of False-Positive Pixels Around the Optic Nerve Head," Proceedings of IEEE International Conference on e-Health and Bioengineering, Iași, Romania, November 2013, pp1-6, DOI 10.1109/EHB.2013.6707365.
253. P. Casti, A. Mencattini, M. Salmeri, and R.M. Rangayyan, "Masking procedures and measures of angular similarity for detection of bilateral asymmetry in mammograms," Proceedings of IEEE International Conference on e-Health and Bioengineering, Iași, Romania, November 2013, pp1-4, DOI 10.1109/EHB.2013.6707258.
252. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. Mangieri, M.L. Pepe, and R.M. Rangayyan, "Design and Analysis of Contour-Independent Features for Classification of Mammographic Lesions," Proceedings of IEEE International Conference on e-Health and Bioengineering, Iasi, Romania, November 2013, pp1-4, DOI 10.1109/EHB.2013.6707401.
251. P. Casti, A. Mencattini, M. Salmeri, A. Ancona, F. Mangieri, and R.M. Rangayyan, "Measures of Radial Correlation and Trend for Classification of Breast Masses in Mammograms," Proc. 35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Osaka, Japan, August 2013, pp6490-6493.
250. F. Oloumi, R. M. Rangayyan, A. Ells, "Quantitative analysis of the major temporal arcade in retinal fundus images of preterm infants for detection of plus disease," Proc. IASTED International Conference on Signal and Image Processing, Banff, Alberta, Canada, July 2013, pp464-469. DOI: 10.2316/P.2013.804-047
249. P. M. Azevedo-Marques, S. M. Pereira, M. A. C. Frade, and R. M. Rangayyan, "Segmentation of Dermatological Ulcers Using Clustering of Color Components," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, Regina, SK, Canada, May 2013.
248. J. Chakraborty, S. Mukhopadhyay, R. M. Rangayyan, A. Sadhu, and P. M. Azevedo-Marques, "Automatic Localization of the Nipple in Mammograms Using Gabor filters and the Radon Transform," Proc. SPIE Medical Imaging 2013: Computer-Aided Diagnosis, Feb. 2013, Vol. 8670, pp 86701S-1-6.
247. F. Oloumi, R. M. Rangayyan, A. Ells, "Quantitative Analysis of the Openness of the Major Temporal Arcade in Retinal Fundus Images of Retinopathy of Prematurity," Proc. First International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT – 2012). Mandya, Karnataka, India, December 2012. **BEST PAPER AWARD.** Published in Emerging Research in Electronics, Computer Science and Technology, Lecture Notes in Electrical Engineering Volume 248, Springer, 2014, pp 829-842. Editors: V. Sridhar, H.S. Sheshadri, and M.C. Padma. DOI 10.1007/978-81-322-1157-0_84

246. S. M. Pereira, M. A. C. Frade, R. M. Rangayyan, and P. M. de Azevedo-Marques, "Recuperação de imagens baseada em seu conteúdo: uma avaliação da performance de métricas de distância," Proc. XXIII Congresso Brasileiro em Engenharia Biomédica – XXIII CBEB, Porto de Galinhas, PE, October 2012, pp1040-1044.
245. E. A. Ribeiro, M. H. Nogueira-Barbosa, R. M. Rangayyan, P. M. Azevedo-Marques, "Detection of Vertebral Compression Fractures in Lateral Lumbar X-ray Images," Proc. XXIII Congresso Brasileiro em Engenharia Biomédica – XXIII CBEB, Porto de Galinhas, PE, October 2012, pp1136-1139.
244. F. Oloumi, R. M. Rangayyan, A. Ells, "Computer-aided diagnosis of proliferative diabetic retinopathy," Proc. 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, CA, August 2012, pp. 1438–1441.
243. R. M. Rangayyan, J. Chakraborty, S. Banik, S. Mukhopadhyay, and J. E. L. Desautels, "Detection of Architectural Distortion Using Coherence in Relation to the Expected Orientation of Breast Tissue," Proceedings of IEEE Computer-based Medical Systems, Rome, Italy, June 2012, pp1-4.
242. J. Chakraborty, S. Mukhopadhyay, V. Singla, N. Khandelwal, and R. M. Rangayyan, "Detection of Masses in Mammograms Using Region Growing Controlled by Multilevel Thresholding," Proceedings of IEEE Computer-based Medical Systems, Rome, Italy, June 2012, pp1-6.
241. R. M. Rangayyan, S. Banik, and J. E. L. Desautels, "Statistical measures of correlation and stationarity in the detection of architectural distortion in prior mammograms of interval cancer," Proc. Computer Assisted Radiology and Surgery, Pisa, Italy, June 2012. International Journal of Computer Assisted Radiology and Surgery, Springer, ppS251-S252.
240. R. M. Rangayyan, S. Banik, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms Using Measures of Angular Dispersion," Proc. IEEE International Symposium on Medical Measurements and Applications, 18-19 May 2012, Budapest, Hungary, pp87-90.
239. F. Oloumi, R.M. Rangayyan, A. Ells, "A Graphical User Interface for Measurement of the Openness of the Retinal Temporal Arcade," Proc. IEEE International Symposium on Medical Measurements and Applications, 18-19 May 2012, Budapest, Hungary, pp238-241.
238. F. Oloumi, R.M. Rangayyan, A. Ells, "A graphical user interface for measurement of temporal arcade angles in fundus images of the retina," Proc. 25th Canadian Conference on Electrical and Computer Engineering (CCECE), 29 April to 2 May 2012, Montreal, PQ, Canada, pp1-4.
237. J. Chakraborty, R. M. Rangayyan, S. Banik, S. Mukhopadhyay, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms Using Statistical Measures of Orientation of Texture," Proceedings of SPIE Medical Imaging 2012: Computer-Aided Diagnosis, San Diego, CA, February 2012. Vol. 8315, pp 831521:1-8, Ed. B. van Ginneken and C. L. Novak.
236. S. M. Pereira, M. A. C. Frade, R. M. Rangayyan, and P. M. de Azevedo-Marques, "Classification of Dermatological Ulcers based on Tissue Composition and Color Texture Features," Fourth International Symposium on Applied Sciences in Biomedical and Communication Technologies, ISABEL 2011, October 26-29, 2011, Barcelona, Spain. ACM. ISBN 978-1-4503-0913-4/11/10.
235. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Detection of architectural distortion in prior mammograms of interval cancer using measures of angular spread and Tsallis entropy," Proc. Computer Assisted Radiology and Surgery, Berlin, Germany, June 2011. International Journal of Computer Assisted Radiology and Surgery, Vol. 6, Suppl. 1, ppS188-189, Springer.
234. E.A. Ribeiro, M.H. Nogueira-Barbosa, F.J. Albuquerque de Paula, R. Rangayyan, P. Azevedo-Marques, "Automatic quantitative evaluation of vertebral morphometry in radiographic images," Proc. Computer Assisted Radiology and Surgery, Berlin, Germany, June 2011. International Journal of Computer Assisted Radiology and Surgery, Vol. 6, Suppl. 1, ppS29-31, Springer.
233. F. Oloumi, R.M. Rangayyan, A. Ells, "Dual-Parabolic Modeling of the Superior and the Inferior Temporal Arcades in Fundus Images of the Retina," Proceedings of the IEEE International Symposium on Medical Measurements and Applications, Bari, Italy, 30-31 May 2011, pp xxxix-xliv. Invited Paper.

232. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Rényi Entropy of Angular Spread for Detection of Architectural Distortion in Prior Mammograms," Proceedings of the IEEE International Symposium on Medical Measurements and Applications, Bari, Italy, 30-31 May 2011, pp609-612.
231. M.R. Smith, R. Brown, M. Helmi, and R. M. Rangayyan , "An empirical investigation into application of a fast discrete 2D S-transform algorithm to provide localized measures of texture in images," Proc. 24th Canadian Conference on Electrical and Computer Engineering (CCECE), 8-11 May 2011, Niagara Falls, ON, Canada, pp201-204. DOI 10.1109/CCECE.2011.6030438
230. R. M. Rangayyan, S. Banik, and J. E. L. Desautels, "Detection of architectural distortion in prior mammograms using measures of angular distribution," Proceedings of SPIE Medical Imaging 2011: Computer-Aided Diagnosis, Orlando, FL, February 2011. Vol. 7963, pp 796308:1-9, Ed. R. M. Summers and B. van Ginneken.
229. S. M. Pereira, M. A. C. Frade, R. M. Rangayyan, and P. M. de Azevedo-Marques, "Quantificação automática de componentes de tecido em imagens de úlceras dermatológicas," XXII Congresso Brasileiro de Engenharia Biomédica – CBEB 2010, 21-25 November 2010, Tiradentes, MG, Brazil, pp1305-1308.
228. E. A. Ribeiro, M. H. Nogueira-Barbosa, R. M. Rangayyan, F. J. de Paula, and P. M. de Azevedo Marques, "Extração automática de medidas relacionadas a morfometria vertebral em imagens de raios-X," XXII Congresso Brasileiro de Engenharia Biomédica – CBEB 2010, 21-25 November 2010, Tiradentes, MG, Brazil, p691.
227. R.M. Rangayyan, F. Oloumi, "Fractal Analysis of Knee-joint Vibroarthrographic Signals," Proc. 10th IEEE International Conference on Information Technology and Applications in Biomedicine (ITAB 2010), Corfu, Greece, 3-5 November 2010. DOI 10.1109/ITAB.2010.5687786, pp1-4.
226. F. Oloumi, R.M. Rangayyan, A. Ells, "Parametric Representation of the Retinal Temporal Arcade," Proc. 10th IEEE International Conference on Information Technology and Applications in Biomedicine (ITAB 2010), Corfu, Greece, 3-5 November 2010. DOI 10.1109/ITAB.2010.5687722, pp1-4.
225. G. Raguso, A. Ancona, L. Chieppa, S. L'Abbate, M.L. Pepe, F. Mangieri, M. De Palo, and R.M. Rangayyan, "Application of Fractal Analysis to Mammography," Proc. 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires, Argentina, September 2010, pp 3182-3185.
224. E.A. Ribeiro, M.H. Nogueira-Barbosa, R.M. Rangayyan, P.M. Azevedo-Marques, "Detection of Vertebral Plateaus in Lateral Lumbar Spinal X-ray Images with Gabor Filters," Proc. 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires, Argentina, September 2010, pp 4052-4055.
223. R.M. Rangayyan, F. Oloumi, and T.M. Nguyen, "Fractal Analysis of Contours of Breast Masses in Mammograms via the Power Spectra of their Signatures," Proc. 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires, Argentina, September 2010, pp 6737-6740.
222. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Detection of architectural distortion in prior mammograms of interval cancer using Laws' texture energy measures," Proc. Computer Assisted Radiology and Surgery, Geneva, Switzerland, June 2010. International Journal of Computer Assisted Radiology and Surgery, Vol. 5, Suppl. 1, ppS200-201, Springer.
221. P. Azevedo-Marques, E. Alvarez Ribeiro, M. Nogueira-Barbosa, and R. Rangayyan, "Segmentation of vertebrae in lateral lumbar spinal X-ray images," Proc. Computer Assisted Radiology and Surgery, Geneva, Switzerland, June 2010. International Journal of Computer Assisted Radiology and Surgery, Vol. 5, Suppl. 1, ppS219-220, Springer.
220. D. Frey, V. Coelho, R. M. Rangayyan, "Spectral Verification of an Experimentally Derived Acoustical Impulse Response Function of a Music Performance Hall," Proceedings IEEE Canadian Conference on Electrical and Computer Engineering (CCECE2010), Calgary, Alberta, Canada, May 2010. DOI 10.1109/CCECE.2010.5575251, pp1-4.
219. S. Seminowich, A. Sar, S.Yilmaz, and R.M. Rangayyan, "Segmentation of cell nuclei in images of renal biopsy samples," Proceedings IEEE Canadian Conference on Electrical and Computer Engineering (CCECE2010), Calgary, Alberta, Canada, May 2010. DOI 10.1109/CCECE.2010.5575162, pp1-4.
218. E. Dorileo, M. Frade, R. M. Rangayyan, P. M. Azevedo-Marques, "Segmentation and Analysis of the Tissue Composition of Dermatological Ulcers," Proceedings IEEE Canadian Conference on Electrical and Computer Engineering (CCECE2010), Calgary, Alberta, Canada, May 2010. DOI 10.1109/CCECE.2010.5575143, pp1-4.

217. S. Banik, R. M. Rangayyan, and J. E. L. Desautels, "Detection of Architectural Distortion in Prior Mammograms Using Fractal Analysis and Angular Spread of Power," Proceedings of SPIE Medical Imaging 2010: Computer-Aided Diagnosis, San Diego, CA, February 2010. Ed. edited by N. Karssemeijer, R. M. Summers, Vol. 7624, pp762408:1-9.
216. S. Banik, R.M. Rangayyan, J.E.L. Desautels, "Detection of Architectural Distortion in Prior Mammograms of Interval-cancer Cases with Neural Networks," Proc. 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN, September 2009. pp6667-6670.
215. F. Oloumi, R.M. Rangayyan, "Detection of the Temporal Arcade in Fundus Images of the Retina Using the Hough Transform," Proc. 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN, September 2009. pp3585-3588.
214. R.M. Rangayyan, S. Banik, S. Prajna, and J.E.L. Desautels, "Detection of architectural distortion in prior mammograms of interval-cancer cases," Proc. Computer Assisted Radiology and Surgery, Berlin, Germany, June 2009. International Journal of Computer Assisted Radiology and Surgery, Springer. vol. 4, suppl. 1, June 2009, ppS171-S173.
213. S. Seminowich, A. Sar, S.Yilmaz, and R.M. Rangayyan, "Segmentation of the effective area of images of renal biopsy samples," Proc. 22nd IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2009), St. John's, NF, Canada, May 2009, pp108-111.
212. D. Frey, V. Coelho, and R.M. Rangayyan, "Filtering and removal of the effects of the transducers on the acoustical impulse response of concert halls," Proc. 22nd IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2009), St. John's, NF, Canada, May 2009, pp368-371.
211. R.M. Rangayyan, X. Zhu, and F.J. Ayres, "Detection of the Optic Disc in Images of the Retina Using Gabor Filters and Phase Portrait Analysis," J. Vander Sloten, P. Verdonck, M. Nyssen, J. Hauelsen (Eds.): ECIFMBE 2008, Proceedings of the 4th European Congress on Biomedical Engineering, November 2008, Antwerp, Belgium, IFMBE Proceedings 22, pp. 468–471.
210. S. Banik, R.M. Rangayyan, G.S. Boag, "Landmarking of Computed Tomographic Images to Assist in Segmentation of Abdominal Tumors Caused by Neuroblastoma," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 3126-3129.
209. X. Zhu, R.M. Rangayyan, "Detection of the Optic Disc in Images of the Retina Using the Hough Transform," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 3546-3549.
208. R.M. Rangayyan, Y.F. Wu, "Modeling and Classification of Knee-Joint Vibroarthrographic Signals Using Probability Density Functions Estimated with Parzen Windows," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 2099-2102.
207. E.A.G. Dorileo, M.A.C. Frade, A.M. Roselino, R.M. Rangayyan, P.M. de Azevedo-Marques, "Color image processing and content-based image retrieval techniques for the analysis of dermatological lesions," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 1230-1233.
206. N.A. Rosa, J.A. Felipe, A. Traina, C. Traina, R.M. Rangayyan, P.M. de Azevedo-Marques, "Using relevance feedback to reduce the semantic gap in content-based image retrieval of mammographic masses," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 406-409.
205. I. Kamenetsky, R.M. Rangayyan, and H. Benediktsson, "Segmentation and Analysis of the Glomerular Basement Membrane Using the Split and Merge Method," Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2008, Vancouver, BC, Canada, pp 3064-3067.
204. R.M. Rangayyan, I. Kamenetsky, and H. Benediktsson, "Segmentation and Analysis of the Glomerular Basement Membrane in Renal Biopsy Samples Using Active Contours," Proc. IET 4th International Conference on Advances in Medical and Signal Processing (MEDSIP 2008), 14-16 July 2008, Santa Margherita Ligure, Italy, Paper 2.1.3 (4 pages).
203. R.M. Rangayyan, S. Banik, and G.S. Boag, "Automatic segmentation of the ribs and the vertebral column in computed tomographic images of pediatric patients," Proc. Computer Assisted Radiology and Surgery, Barcelona, Spain, June 2008. International Journal of Computer Assisted Radiology and Surgery, Vol. 3, Suppl. 1, pp S177-S178, Springer.

202. R.M. Rangayyan, S. Prajna, F.J. Ayres, and J.E.L. Desautels, "Detection of Architectural Distortion in Prior Mammograms using Fractal Dimension and Texture Features," Proc. Computer Assisted Radiology and Surgery, Barcelona, Spain, June 2008. International Journal of Computer Assisted Radiology and Surgery, Vol. 3, Suppl. 1, pp S42-S44, Springer.
201. D. Frey, V. Coelho, and R.M. Rangayyan, "The Loudspeaker as a Measurement Sweep Generator for the Derivation of the Acoustical Impulse Response of a Concert Hall," Proc. 21st IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2008), Niagara Falls, ON, Canada, May 2008, pp 301 – 304.
200. S. Banik, R.M. Rangayyan, and G.S. Boag, "Delineation of the Pelvic Girdle in Computed Tomographic Images," Proc. 21st IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2008), Niagara Falls, ON, Canada, May 2008, pp 179 – 182.
199. R.M. Rangayyan and Y.F. Wu, "Screening of knee-joint vibroarthrographic signals using parameters of activity and radial-basis functions," Proc. 21st IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2008), Niagara Falls, ON, Canada, May 2008, pp 57 – 60.
198. S. Prajna, R.M. Rangayyan, F.J. Ayres, and J.E.L. Desautels, "Detection of architectural distortion in mammograms acquired prior to the detection of breast cancer using texture and fractal analysis," Proc. SPIE International Symposium on Medical Imaging: Image Processing, vol. 6915, San Diego, CA, February 2008, pp 691529:1-8.
197. Y.F. Wu, R.M. Rangayyan, Y. Wu, and S.C. Ng, "Filtering of Noise in Electrocardiographic Signals Using An Unbiased and Normalized Adaptive Artifact Cancellation System," Proc. Joint Meeting of the 6th International Symposium on Noninvasive Functional Source imaging of the Brain and Heart & the International Conference on Functional Biomedical Imaging (NFSI&ICFBI'07), Oct 12 – 14, 2007, Hangzhou, China, pp 173 – 176.
196. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Strict 2-Surface Proximal Classification of Knee-joint Vibroarthrographic Signals," Proc. 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2007, Lyon, France, pp 4911-4914.
195. Y.F. Wu, R.M. Rangayyan, and S.C. Ng, "Cancellation of Artifacts in ECG Signals Using a Normalized Adaptive Neural Filter," Proc. 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2007, Lyon, France, pp 2552-2555.
194. Faraz Oloumi, R.M. Rangayyan, Foad Oloumi, P. Eshghzadeh-Zanjani, and F.J. Ayres, "Detection of Blood Vessels in Fundus Images of the Retina using Gabor Wavelets," Proc. 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2007, Lyon, France, pp 6451-6454. **Finalist in Student Paper Competition.**
193. R.S. Bôaventura, D. Guliato, M.S. Simedo, M.A. Maia, T.A.A. Macedo, R.M. Rangayyan, "INDIAM – Um sistema de ensino para auxiliar estudantes na interpretação de mamogramas e diagnóstico de câncer de mama via Web," Proc. VII Workshop de Informática Médica, Porto de Galinhas, PE, Brasil, 25-26 June, 2007, 10p on CDROM.
192. R.M. Rangayyan, T.M. Nguyen, F. J. Ayres, A.K. Nandi, "Analysis of the Effect of Spatial Resolution on Texture Features in the Classification of Breast Masses in Mammograms," Proc. Computer Assisted Radiology and Surgery, Berlin, Germany, June 2007. Springer. pp 334-336.
191. R.M. Rangayyan and Y.F. Wu, "Analysis of Knee-joint Vibroarthrographic Signals Using Statistical Measures," Proc. 20th IEEE International Symposium on Computer-Based Medical Systems, Maribor, Slovenia, June 2007, pp 377-382.
190. Y.F. Wu and R.M. Rangayyan, "An Unbiased Linear Artificial Neural Network with Normalized Adaptive Coefficients for Filtering Noisy ECG Signals," CDROM Proc. 20th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2007), pp 868-871, Vancouver, BC, 22 – 26, April 2007.
189. Y.F. Wu and R.M. Rangayyan, "An Algorithm for Evaluating the Performance of Adaptive Filters for the Removal of Artifacts in ECG Signals," CDROM Proc. 20th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2007), pp 864-867, Vancouver, BC, 22 – 26, April 2007.
188. R.M. Rangayyan, Faraz Oloumi, Foad Oloumi, P. Eshghzadeh-Zanjani, and F.J. Ayres, "Detection of Blood Vessels in the Retina using Gabor Filters," CDROM Proc. 20th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2007), pp 717-720, Vancouver, BC, 22 – 26, April 2007.

187. J. Daloia de Carvalho, D. Guliato, S. A. Santiago, R.M. Rangayyan, "Polygonal Modeling of Contours using the Turning Angle Function," CDROM Proc. 20th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2007), pp 1090-1093, Vancouver, BC, 22 – 26, April 2007.
186. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Strict 2-surface proximal classifier with application to breast cancer detection in mammograms," Proc. IEEE 32nd International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Honolulu, HI, April 2007, pp II:477 – 480.
185. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Pairwise Rayleigh quotient classifier with application to the analysis of breast tumors," Proc. 4th IASTED International Conference on Signal Processing, Pattern Recognition, and Applications, Innsbruck, Austria, February 2007, pp 356 – 361.
184. T. Mu, A. K. Nandi, and R.M. Rangayyan, "Classification of breast masses via transformation of features using kernel principal component analysis," Proc. 5th IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2007, pp 396 – 401.
183. D. Guliato, E. V. de Melo, R. C. Soares, and R.M. Rangayyan, "A system design for content-based image retrieval and analysis of mammograms using POSTGRESQL with image-handling extension," Proc. 5th IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2007, pp 402 – 408.
182. D. Guliato, R. S. Bôaventura, M. S. Simedo, R. M. Rangayyan, T. A. A. Macedo, "A Teaching System for Assistance in the Interpretation of Mammograms and the Diagnosis of Breast Cancer," IEEE Special Topic Symposium on Information Technology in Biomedicine, Ionnina, Greece, October 2006, 4 pages on CDROM.
181. R. M. Rangayyan, D. Guliato, J. Daloia de Carvalho, S. A. Santiago, "Feature Extraction from the Turning Angle Function for the Classification of Contours of Breast Tumors," IEEE Special Topic Symposium on Information Technology in Biomedicine, Ionnina, Greece, October 2006, 4 pages on CDROM.
180. T. C. S. Santos-André, E. L. Cheade, P. M. Azevedo Marques, R. M. Rangayyan, J. A. H. Rodrigues, R. G. S. Rodrigues, "Discriminação de áreas prováveis de crescimento do câncer de mama em mamogramas anteriores à detecção," (in Portuguese) Anais do XX Congresso Brasileiro de Engenharia Biomédica, São Pedro, SP, October 2006, pp 225 – 228.
179. D. Guliato, R.M. Rangayyan, J. Daloia de Carvalho, S. A. Santiago, "Spiculation-Preserving Polygonal Modeling of Contours of Breast Tumors," 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2006, New York, NY, pp 3021 – 3024.
178. R. J. Nandi, A. K. Nandi, R.M. Rangayyan, D. Scutt, "Genetic Programming and Feature Selection for Classification of Breast Masses in Mammograms," 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2006, New York, NY, pp 2791 – 2794.
177. E. V. de Melo, D. Guliato, R.M. Rangayyan, and R. Soares, "SISPRIM – Sistema de Pesquisa com Suporte para Recuperação de Imagens Mamográficas baseada em conteúdo," Proc. Simpósio Brasileiro de Qualidade de Software 2006 – Workshop de Informática Médica, Vila Velha, ES, Brasil, 29 May – 2 June, 2006, 9 pages.
176. R.M. Rangayyan, R. Vu, and G.S. Boag, "Delineation of the diaphragm in CT images to improve segmentation of the tumor mass in neuroblastoma," Proc. Computer Assisted Radiology and Surgery, Osaka, Japan, June 2006. Springer. pp 78 – 80.
175. R.M. Rangayyan and F.J. Ayres, "Detection of architectural distortion in mammograms using a shape-constrained phase portrait model," Proc. Computer Assisted Radiology and Surgery, Osaka, Japan, June 2006. Springer. pp 334 – 336.
174. R. Vu, R.M. Rangayyan, and G.S. Boag, "Multi-seed segmentation of the primary tumor mass in neuroblastoma using opening-by-reconstruction," Proc. 4th IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2006, pp 242 – 249.
173. F.J. Ayres and R.M. Rangayyan, "Optimization procedures for the estimation of phase portrait parameters in orientation fields," Proc. IS&T/ SPIE Symposium on Electronic Imaging – Image Processing: Algorithms and Systems V, vol. 6064, San Jose, CA, January 2006. DOI:10.1117/12.644852, pp 606407:1-12.

172. B. Acha, C. Serrano, and R.M. Rangayyan, "Detection of microcalcifications in mammograms using 2D prediction filtering and a new statistical measure of the right tail weight," IFMBE Proceedings, Vol. 11, ISSN 1727-1983, Editors: J. Hozman, P. Kneppo, Proceedings of the 3rd European Medical & Biological Engineering Conference: EMBEC'05, Prague, Czech Republic, November 2005, paper number 2251, pages 3112 – 3117.
171. F.J. Ayres and R.M. Rangayyan, "Detection of architectural distortion in mammograms via analysis of phase portraits and curvilinear structures," IFMBE Proceedings, Vol. 11, ISSN 1727-1983, Editors: J. Hozman, P. Kneppo, Proceedings of the 3rd European Medical & Biological Engineering Conference: EMBEC'05, Prague, Czech Republic, November 2005, paper number 1873, pages 1768 – 1773.
170. H. Bosnak, R. Grewal, J. Howland, B. Liu, and R.M. Rangayyan, "Computer-aided diagnosis of breast cancer via an indexed atlas and content-based retrieval of mammograms," IFMBE Proceedings, Vol. 11, ISSN 1727-1983, Editors: J. Hozman, P. Kneppo, Proceedings of the 3rd European Medical & Biological Engineering Conference: EMBEC'05, Prague, Czech Republic, November 2005, paper number 1872, pages 1762 – 1767.
169. H.J. Deglint and R.M. Rangayyan, "Segmentation of neuroblastoma in CT images using image reconstruction, deformable models, and convex hulls," Third IEE International Seminar on Medical Applications of Signal Processing, London, UK, 3 – 4 November 2005, pp 29 – 34.
168. L. A. Silva, E. Del-Moral-Hernandez, and R. M. Rangayyan, "Classificação de tumores e massas de mama utilizando um comitê de perceptrons de múltiplas camadas," Proceedings of the VII CBRN – Congresso Brasileiro de Redes Neurais, VIII ERN – Escola de Redes Neurais, and I JCI – Jogos Computacionais Inteligentes, Natal, RN, Brasil, 16 – 19 October, 2005, 6 pp, ISSN:1808-8589.
167. F.J. Ayres and R.M. Rangayyan, "Performance analysis of oriented feature detectors," Proc. SIBGRAPI 2005: XVIII Brazilian Symposium on Computer Graphics and Image Processing (IEEE Computer Society Press), Natal, Rio Grande do Norte, Brazil, October 2005, pp 147 – 154.
166. T.M. Nguyen and R.M. Rangayyan, "Shape analysis of breast masses in mammograms via the fractal dimension," 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2005, Shanghai, China, Paper no. 1852, 4 pages.
165. Y. Sun, J. Suri, Z. Ye, R.M. Rangayyan, and R. Janer, "Effect of adaptive-neighborhood contrast enhancement on the extraction of the breast skin-line in mammograms," 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2005, Shanghai, China, Paper no. 2063, 4 pages.
164. Y. Sun, J. Suri, R. M. Rangayyan, and R. Janer, "Relationship between the stroma edge and skin-air boundary for generating a dependency approach to skin-line estimation in screening mammograms," 3rd International Conference on Advances in Pattern Recognition, ICAPR 2005, pp. 746-753, August 22-25, 2005, Bath, United Kingdom.
163. D. Guliato, R.S. Bôaventura, E.V. de Melo, V. de Deus, F.R. Janones, and R.M. Rangayyan, "AMDI: An atlas to integrate case studies, e-learning, and research systems via the Web," Proc. IASTED International Conference on Telehealth, July 2005, pp 69 – 74.
162. Y. Sun, J. Suri, and R. M. Rangayyan, "A novel approach for breast skin-line estimation in mammograms," The 18th IEEE Symposium on Computer-Based Medical Systems, CBMS 2005, June 22-24, 2005, Dublin, Ireland, pp. 241-246.
161. Y. Sun, J. Suri, and R. M. Rangayyan, "An inward mammilla detection algorithm for analysis of skin-line retraction," Medical Physics, vol. 32, no. 6, June 2005, pp. 1908-1909. (AAPM abstract SU-FF-I-22).
160. R.M. Rangayyan and T.M. Nguyen, "Pattern classification of breast masses via fractal analysis of their contours," Proc. Computer Assisted Radiology and Surgery, Berlin, Germany, June 2005. International Congress Series 1281, Elsevier, pp 1041 - 1046.
159. H.J. Deglint, R.M. Rangayyan, and G.S. Boag, "Strategies for three-dimensional segmentation of the neuroblastoma tumor mass in computed tomographic images," Annual Meeting of the Society for Computer Applications in Radiology, June 2005, Orlando, FL, pp 103 – 105.

158. R. do Espírito Santo, R. de Deus Lopes, and R.M. Rangayyan, "Classification of mammographic masses using radial basis functions and simulated annealing with shape, acutance, and texture features," Proc. 3rd IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2005, pp 164-167.
157. L.A. Silva, E. del Moral Hernandez, and R.M. Rangayyan, "Classification of breast masses using a committee machine of neural networks," Proc. 3rd IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2005, pp 168-173.
156. Y. Sun, J. Suri, R.M. Rangayyan, and R. Janer, "A microscopic look at breast skin-line metrics: A performance evaluation strategy for FFDM/ screen-film projection mammograms," Proc. 3rd IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2005, pp 174-179.
155. T.M. Nguyen and R.M. Rangayyan, "Fractal analysis of contours of mammographic masses," Proc. 3rd IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2005, pp 186-191.
154. R.M. Rangayyan and H.J. Deglint, "Automatic detection and segmentation of the spinal canal in computed tomographic images," Proc. 3rd IASTED International Conference on Biomedical Engineering, Innsbruck, Austria, February 2005, pp 38-43.
153. T.C.S. Santos André , P.M. de Azevedo Marques, J.A.H. Rodrigues, and R.M. Rangayyan, "Sistema de recuperação de imagens baseada em conteúdo usando mapas de Kohonen e técnicas de correlação cruzada," IX Congresso Brasileiro de Informática em Saúde (CBIS), Ribeirão Preto, SP, 7 – 10 Novembro 2004, 5pp (CDROM).
152. T.C.S. Santos André , P.M. de Azevedo Marques, J.A.H. Rodrigues, and R.M. Rangayyan, "Content-based image retrieval using self-organizing maps and cross correlation," III Congresso Latinoamericano de Ingeniería Biomédica, João Pessoa, Paraíba, Brazil, September 2004, pp 1379-1382.
151. D. Guliato, M. Caetano, F.R. Janones, S.C.L. Lima, V. Deus, R.M. Rangayyan, R.S. Bôaventura, , P.M. de Azevedo Marques, and J.A.H. Rodrigues, "AMDI – Um atlas indexado para mamografias digitais via web," III Congresso Latinoamericano de Ingeniería Biomédica, João Pessoa, Paraíba, Brazil, September 2004, pp 529-532.
150. L.A. da Silva, E. del Moral Hernandez, and R.M. Rangayyan, "Classificação de tumores e massas de mama utilizando máquinas de comitê," III Congresso Latinoamericano de Ingeniería Biomédica, João Pessoa, Paraíba, Brazil, September 2004, pp 935-938.
149. H. Lau, K. Mok, D. So, C. Tse, and R.M. Rangayyan, "An indexed atlas for content-based retrieval and analysis of mammograms," 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2004, San Francisco, CA, pp 3167-3170.
148. Y. Liu, M.R. Smith, and R.M. Rangayyan, "The application of Efron's bootstrap methods in validating feature classification using artificial neural networks for the analysis of mammographic masses," 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2004, San Francisco, CA, pp 1553-1556.
147. R. do Espírito Santo, R.D. Lopes, and R.M. Rangayyan, "Radial basis functions – simulated annealing classification of mammographic calcifications," 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2004, San Francisco, CA, pp 1644-1647.
146. R.M. Rangayyan, R.J. Ferrari, and A.F. Frère, "Detection of asymmetry between left and right mammograms," 7th International Workshop on Digital Mammography, Chapel Hill, NC, June 2004, pp 651 – 658.
145. D. Guliato, M. Caetano, R.M. Rangayyan, P.M. de Azevedo Marques, and J.A.H. Rodrigues, "Database architecture and query strategies for content-based retrieval of mammograms," 7th International Workshop on Digital Mammography, Chapel Hill, NC, June 2004, pp 376 – 381.
144. D. Guliato, M. Caetano, F.R. Janones, V. de Deus, P.M. de Azevedo Marques, R.M. Rangayyan, S.C.L. de Lima, T.A. Medeiros, and J.A.H. Rodrigues, "AMDI – An indexed atlas of digital mammograms available via the web," 7th International Workshop on Digital Mammography, Chapel Hill, NC, June 2004, pp 370 – 375.
143. X. Wang, M.R. Smith, and R.M. Rangayyan, "Mammographic information analysis through association-rule mining," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, Niagara Falls, ON, May 2004. pp 1495-1498.

142. F.J. Ayres and R.M. Rangayyan, "Detection of architectural distortion in mammograms using phase portraits," Proc. SPIE International Symposium on Medical Imaging: Image Processing, vol. 5370, San Diego, CA, February 2004. pp 587-597.
141. H.J. Deglint, R.M. Rangayyan, and G.S. Boag, "Three-dimensional segmentation of the tumor mass in computed tomographic images of neuroblastoma," Proc. SPIE International Symposium on Medical Imaging: Image Processing, vol. 5370, San Diego, CA, February 2004. pp 475-483.
140. F.J. Ayres and R.M. Rangayyan, "An iterative linear algorithm for the analysis of phase portraits," Proc. IS&T/ SPIE Symposium on Electronic Imaging – Image Processing: Algorithms and Systems III, vol. 5298, San Jose, CA, January 2004, pp 232-241.
139. F.J. Ayres and R.M. Rangayyan, "Characterization of architectural distortion in mammograms," paper no. 2.4.4.5 (4 pp) in CDROM Proc. 25th Ann. Intl. Conf. IEEE Engineering in Medicine and Biology Society, Cancún, Mexico, September 2003. **Winner of the Second Prize in the Student Paper Competition with 314 entries.**
138. T.C.S.S. André and R.M. Rangayyan, "Classification of tumors and masses in mammograms using neural networks with shape and texture features," paper no. 6.7.2.4 (4 pp) in CDROM Proc. 25th Ann. Intl. Conf. IEEE Engineering in Medicine and Biology Society, Cancún, Mexico, September 2003.
137. R.B. Paranjape, L. Benedicenti, R.M. Rangayyan, and Q.A. Liu, "A mobile-agent-based mammogram retrieval system," pp 213-220, Proc. ATS2003: Agent Based Technologies and Systems, Calgary, Alberta, Canada, August 2003.
136. D. Guliato, R.M. Rangayyan, F. Adorno, and M.M.G. Ribeiro, "Analysis and classification of breast masses by fuzzy-set-based image processing," Proc. Sixth International Workshop on Digital Mammography, Bremen, Germany, Ed: H.O. Peitgen, 22-25 June 2002. Springer-Verlag: Berlin Heidelberg, Germany. pp 195-197.
135. H. Alto, R.M. Rangayyan, and J.E.L. Desautels, "An indexed atlas of digital mammograms," Proc. Sixth International Workshop on Digital Mammography, Bremen, Germany, Ed: H.O. Peitgen, 22-25 June 2002. Springer-Verlag: Berlin Heidelberg, Germany. pp 309-311.
134. H. Alto, R.M. Rangayyan, B. Solaiman, J.E.L. Desautels, and J.H. MacGregor, "Image processing, radiological, and clinical information fusion in breast cancer detection," Proc. SPIE Vol. 4731 on Sensor Fusion: Architectures, Algorithms, and Applications VI, Orlando, FL, 3-5 April 2002, pp 134-144.
133. N.R. Mudigonda and R.M. Rangayyan, "Texture flow-field analysis for the detection of architectural distortion in mammograms," Proc. BioVision, Bangalore, India, 21-24 December 2001, pp 76-81.
132. F.J. Ayres, M.K. Zuffo, R.M. Rangayyan, V. Odone, and M. Valente, "Segmentation and estimation of the histological composition of the tumor mass in computed tomographic images of neuroblastoma," Proc. 23rd Ann. Intl. Conf. IEEE Engineering in Medicine and Biology Society, Oct. 2001, Istanbul, Turkey, pp 2700 – 2703, CDROM.
131. S. Krishnan, R.M. Rangayyan, and K. Umopathy, "A time-frequency approach for auditory display of time-varying signals," pp 236-241, Proc. IASTED Intl. Conf. Signal and Image Processing, Honolulu, HI, Aug.2001.
130. C. Serrano, J.D. Trujillo, B. Acha, and R.M. Rangayyan, "Use of 2D linear prediction error to detect microcalcifications in mammograms," II Latin American Congress on Biomedical Engineering, Havana, Cuba, 23-25 May 2001, 4 pages on CDROM.
129. R.M. Rangayyan, R.J. Ferrari, J.E.L. Desautels, and A.F. Frère, "Directional analysis of images with Gabor wavelets," Proc. SIBGRAPI 2000: XIII Brazilian Symposium on Computer Graphics and Image Processing (IEEE Computer Society Press), Gramado, Rio Grande do Sul, Brazil, 17-20 October, 2000, pp 170-177.
128. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, and A.F. Frère, "Segmentação de mamogramas: Identificação da borda da mama, músculo peitoral e disco glandular," (Portuguese version of item 123) Anais do Congresso Brasileiro de Engenharia Biomédica, Florianópolis, Santa Catarina, Brazil, 11-13 Sept., 2000, pp 1255-1261.
127. S. Krishnan, R.M. Rangayyan, G.D. Bell, and C.B. Frank, "Sonification of knee-joint vibration signals," Proceedings of World Congress on Medical Physics and Biomedical Engineering, Chicago, IL, July 2000, four pages on CDROM.

126. H. Alto, R.M. Rangayyan, and D. Gavrilov, "Parallel implementation of an algorithm to detect calcifications in mammograms," Proc. SPIE vol. 4118: Parallel and Distributed Methods for Image Processing IV, San Diego, CA, July 2000, pp 79-87.
125. N.R. Mudigonda, R.M. Rangayyan, and J.E.L. Desautels, "Detection of masses in mammograms using flow-field principles," Proc. 5th International Workshop on Digital Mammography, Toronto, ON, June 2000, Editor: M.J. Yaffe, pp 308-314.
124. R.J. Ferrari, R.M. Rangayyan, J.E.L. Desautels, and A.F. Frère, "Segmentation of mammograms: Identification of the skin-air boundary, pectoral muscle, and fibro-glandular disc," Proc. 5th International Workshop on Digital Mammography, Toronto, ON, June 2000, Editor: M.J. Yaffe, pp 573-579.
123. C. Vertan, M. Ciuc, V. Buzuloiu, and R.M. Rangayyan, "Color edge detection by perceptual assessment of local non-uniformity," Proc. of 7th Intl. Conf. on Optimization and Electronic Equipments OPTIM 2000, Braşov, Romania, May 2000, pp 804-807.
122. N.R. Mudigonda, R.M. Rangayyan, and J.E.L. Desautels, "Segmentation and classification of mammographic masses," Proc. SPIE vol. 3979: Medical Imaging, San Diego, CA, February 2000, pp 55-67.
121. R.M. Rangayyan, S. Krishnan, G.D. Bell, and C.B. Frank, "Computer-aided auscultation of knee joint vibration signals," Proceedings of EMBEC'99 - European Medical & Biological Engineering Conference, Vienna, Austria, Nov. 1999, pp 464-465.
120. S. Krishnan and R.M. Rangayyan, "Adaptive time-frequency analysis of knee joint vibroarthrographic signals," Proceedings of EMBEC'99 - European Medical and Biological Engineering Conference, Vienna, Austria, November 1999, pp 466-467.
119. B. Acha, C. Serrano, and R.M. Rangayyan, "Detection of microcalcifications in mammograms by seed selection and multitolerance region growing," Proceedings of EMBEC'99 - European Medical and Biological Engineering Conference, Vienna, Austria, November 1999, pp 984-985.
118. C. Serrano, B. Acha, and R.M. Rangayyan, "Segmentation-based lossless compression for color images," Proc. ICIAP'99 - 10th International Conference on Image Analysis and Processing, Venice, Italy, Sept. 27-29, 1999, pp 90-94.
117. H. Alto, D. Gavrilov, and R.M. Rangayyan, "Parallel implementation of the adaptive neighborhood contrast enhancement algorithm," Proceedings of SPIE Vol. 3817, Parallel and Distributed Methods for Image Processing, 1999, pp 88-97.
116. S. Krishnan and R.M. Rangayyan, "Feature identification in the time-frequency distributions of knee joint vibrations signals using the Hough-Radon transform," Proc. International Conference on Robotics, Vision, and Parallel Processing for Automation, Ipoh, Malaysia, July 1999, pp 82-89.
115. S. Krishnan and R.M. Rangayyan, "Denoising knee joint vibration signals using adaptive time-frequency representations," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, Edmonton, AB, 1-12 May 1999, pp 1495-1500.
114. N.R. Mudigonda, R.M. Rangayyan, and J.E.L. Desautels, "Concavity and convexity analysis of mammographic masses via an iterative segmentation algorithm," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, Edmonton, AB, 1-12 May 1999, pp 1489-1494.
113. R.D. Lopes and R.M. Rangayyan, "Lossless volumetric data compression via decomposition based upon region growing," SPIE Conference on Medical Imaging - Image Display, San Diego, CA, 20-26 February, 1999, vol. 3658, pp 427-435.
112. D. Guliato, R.M. Rangayyan, W.A. Carnielli, J.A. Zuffo, and J.E.L. Desautels, "Fuzzy fusion of results of medical image segmentation," SPIE Conference on Medical Imaging - Image Processing, San Diego, CA, 20-26 Feb. 1999, vol. 3661, 1075-1084.
111. V. Buzuloiu, M. Ciuc, R.M. Rangayyan, L. Kij, and C. Vertan, "Histogram equalization of color images using the adaptive neighborhood approach," Proc. SPIE Conference on Nonlinear Image Processing X, San Jose, CA, 25-26 January 1999, vol. 3646, pp 330-338.

110. S. Krishnan and R.M. Rangayyan, 1998, "Detection of nonlinear frequency-modulated components in the time-frequency plane using an array of accumulators," IEEE-SP International Symposium on Time-frequency and Time-scale Analysis, Pittsburgh, PA, 6-9 October 1998, pp 557-560.
109. R.M. Rangayyan and S. Krishnan, 1998, "Comparative analysis of the performance of the time-frequency distributions with knee joint vibroarthrographic signals," IEEE-SP International Symposium on Time-frequency and Time-scale Analysis, Pittsburgh, PA, 6-9 October 1998, pp 273-276.
108. D. Guliato, R.M. Rangayyan, W.A. Carnielli, J.A. Zuffo, and J.E.L. Desautels, 1998, "Segmentation of breast tumors in mammograms by fuzzy region growing," Proc. 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Hong Kong, 29 October - 1 November 1998, pp II:1002-1004; 4 pages on CD-ROM.
107. D. Guliato, R.M. Rangayyan, J.A. Zuffo, and J.E.L. Desautels, 1998, "Detection of breast tumor boundaries using iso-intensity contours and dynamic thresholding," Proc. 4th International Workshop on Digital Mammography, Nijmegen, The Netherlands, 7-10 June 1998, Editors: N. Karssemeijer, M. Thijssen, J. Hendriks, and L. van Erning, Kluwer Academic, Dordrecht, The Netherlands, pp 253-260.
106. R.M. Rangayyan and M.K. Zuffo, 1998, "Iconographic display of mammographic features for computer-aided diagnosis of breast cancer," Proc. IEEE International Conference on Information Technology Applications in Biomedicine, Washington DC, 16-17 May 1998, pp 91-96.
105. C. Vertan, V. Buzuloiu, and R.M. Rangayyan, 1998, "A family of order statistic based dissimilarity measures and their application in image processing," Proc. 6th International Conference on Optimization of Electrical and Electronic Equipment, Brasov, Romania, May 14-15, 1998, pp 711-714.
104. M. Ciuc, R.M. Rangayyan, T. Zaharia, and V. Buzuloiu, 1998, "Adaptive neighborhood filters for color image filtering," Proc. SPIE vol. 3304 on Nonlinear Image Processing IX, Editors: E.R. Dougherty and J.T. Astola, San Jose, CA, 26-27 January 1998, pp 277-286.
103. S. Krishnan, R.M. Rangayyan, G.D. Bell, C.B. Frank, "Time-frequency signal feature extraction and screening of knee joint vibroarthrographic signals using the matching pursuit method," Proc. 19th Annual International Conference, IEEE Engineering in Medicine and Biology Society, Chicago, IL, Oct. 1997, 4 pages on CD-ROM.
102. R.M. Rangayyan and A.C.G. Martins, "Texture element extraction via cepstral filtering of projections," Proc. IEEE International Conference on Image Processing, 1997, pp 217-219.
101. A.C.G. Martins and R.M. Rangayyan, "Experimental evaluation of auditory display and sonification of textured images," Proc. International Conference on Auditory Display, Palo Alto, CA, 1997, pp1-5.
100. O. Menut, R.M. Rangayyan, and J.E.L. Desautels, "Classification of breast tumors via parabolic modeling of their contours," Proc. IEEE Pacific Rim Conference on Communications, Computers, and Signal Processing (PACRIM'97), August 20-22, 1997, Victoria, BC, Canada, pp1002-1005.
99. S. Krishnan and R.M. Rangayyan, "Detection of chirp and other components in the time-frequency plane using the Hough and Radon transforms," Proc. IEEE Pacific Rim Conference on Communications, Computers, and Signal Processing (PACRIM'97), August 20-22, 1997, Victoria, BC, Canada, pp138-141.
98. A. Das and R.M. Rangayyan, "Enhancement of image edge sharpness and acutance," Proc. SPIE vol. 3026 on Nonlinear Image Processing VIII, San Jose, CA, 10-11 February 1997, pp 133-142.
97. A. Das and R.M. Rangayyan, "Adaptive region-based filtering of multiplicative noise," Proc. SPIE vol. 3026 on Nonlinear Image Processing VIII, San Jose, CA, 10-11 February 1997, pp 338-348.
96. A.C.G. Martins, R.M. Rangayyan, L.A. Portela, E. Amaro Junior, R.A. Ruschioni, "Auditory display and sonification of textured images," Proc. International Conference on Auditory Display, Palo Alto, CA, November 4-6, 1996, pp 9-11.
95. S. Krishnan, R.M. Rangayyan, G.D. Bell, C.B. Frank, and K.O. Ladly, 1996, "Screening of knee joint vibroarthrographic signals by statistical pattern analysis of dominant poles," Proc. 18th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Amsterdam, The Netherlands, 30 October - 2 November 1996, 2 pages on CDRom.

94. R.M. Rangayyan, "Digital image processing techniques for computer-aided diagnosis of breast cancer," Invited Paper, Proc. Forum Nacional de Ciência e Tecnologia em Saúde, Campos do Jordão, Brazil, Oct. 1996, pp 831-843.
93. S. Krishnan, R.M. Rangayyan, C.B. Frank, G.D. Bell, and K.O. Ladly, 1996, "Adaptive segmentation and cepstral analysis of vibroarthrographic signals for non-invasive diagnosis of knee joint cartilage pathology," Proc. 22nd Canadian Medical and Biological Engineering Society Conference, Charlottetown, PEI, Canada, 26-29 June, 1996, pp 8-9.
92. R.M. Rangayyan, N.M. El-Faramawy, J.E.L. Desautels, and O.A. Alim, 1996, "Discrimination between benign and malignant breast tumors using a region-based measure of edge profile acutance," Proc. 3rd International Workshop on Digital Mammography, Chicago, IL, 9-12 June 1996, pp 213-218.
91. R.M. Rangayyan, S. Krishnan, G.D. Bell, C.B. Frank, and K.O. Ladly, 1996, "Impact of muscle contraction interference cancellation on vibroarthrographic screening," Proc. International Conference on Biomedical Engineering, Hong Kong, 3-5 June 1996, pp L16-L19.
90. B. Solaiman, C. Roux, R.M. Rangayyan, F. Pipelier, and A. Hillion, 1996, "Fuzzy edge evaluation in ultrasound endosonographic images," Proc. Canadian Conference on Electrical and Computer Engineering, Calgary, AB, Canada, 25-29 May 1996, pp 335-338.
89. N.M. El-Faramawy, R.M. Rangayyan, J.E.L. Desautels, and O.A. Alim, 1996, "Shape factors for analysis of breast tumors in mammograms," Proc. Canadian Conference on Electrical and Computer Engineering, Calgary, AB, Canada, 25-29 May 1996, pp 355-358.
88. A.C.G. Martins and R.M. Rangayyan, 1996, "Cepstral filtering and analysis of image texture in the Radon domain," Proc. Canadian Conference on Electrical and Computer Engineering, Calgary, AB, Canada, 25-29 May 1996, pp 466-469.
87. S. Krishnan, R.M. Rangayyan, G.D. Bell, C.B. Frank, and K.O. Ladly, 1996, "Recursive least-squares lattice-based adaptive segmentation and autoregressive modeling of knee joint vibroarthrographic signals," Proc. Canadian Conference on Electrical and Computer Engineering, Calgary, AB, Canada, 25-29 May 1996, pp 339-342.
86. L. Shen and R.M. Rangayyan, 1996, "Improved Joint Bi-level Image Experts Group (JBIG) data compression of continuous-tone images," Proc. SPIE vol. 2727 on Visual Communication and Image Processing, Orlando, FL, 17-20 March 1996, pp 54-65.
85. L. Shen, Y. Shen, R.M. Rangayyan, J.E.L. Desautels, H. Bryant, T.J. Terry, and N. Horeczko, 1996, "Earlier detection of interval breast cancers with adaptive neighborhood contrast enhancement of mammograms," Proc. SPIE vol. 2710 on Medical Imaging 1996: Image Processing, Newport Beach, CA, 10-15 Feb. 1996, pp 940-949.
84. S.D. Olabarriaga and R.M. Rangayyan, 1996, "Subjective and objective evaluation of image sharpness- Behavior of the region-based image edge profile acutance measure," Proc. SPIE vol. 2712 on Medical Imaging 1996: Image Perception, Newport Beach, CA, 10-15 Feb. 1996, pp 154-162.
83. R.D. Lopes, M.K. Zuffo, and R.M. Rangayyan, 1996, "Three-dimensional region-based adaptive image processing techniques for volume visualization applications," Proc. SPIE vol. 2707 on Medical Imaging 1996: Image Display, Newport Beach, CA, 10-15 Feb. 1996, pp 21-31.
82. R.M. Rangayyan, A.C.G. Martins, and R.A. Ruschioni, 1996, "Aural analysis of image texture via cepstral filtering and sonification" Proc. SPIE vol. 2656 on Visual Data Exploration and Analysis III, San Jose, CA, 27 Jan. - 2 Feb. 1996, pp 283-294.
81. R.D. Lopes and R.M. Rangayyan, 1995, "3D region-based filters for noise removal," Proc. IASTED/IEEE International Conference on Signal and Image Processing, Las Vegas, 20-23 Nov. 1995, pp 424-427.
80. L. Shen and R.M. Rangayyan, 1995, "Segmentation-based lossless coding of medical images," Proc. SPIE vol. 2501 on Visual Communications and Image Processing, pp 974-982.
79. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1995, "Three-dimensional restoration of single photon emission computed tomography images using the Kalman-Metz filter," in "Computerized Tomography," Proc. Fourth International Symposium on Computerized Tomography, Novosibirsk, Russia, 10-14 August 1993, published by VSP BV, The Netherlands, 1995, pp 98-105.

78. R.M. Rangayyan, L. Shen, R.B. Paranjape, J.E.L. Desautels, J.H. MacGregor, H.F. Morrish, P. Burrowes, S. Share, and F.R. MacDonald, 1994, "An ROC evaluation of adaptive neighborhood contrast enhancement for digitized mammography," Proc. 2nd Intl. Workshop on Digital Mammography, York, U.K., July 1994, pp 307-313.
77. R.M. Rangayyan, 1994, "Recent advances in image processing and computer vision: Region-based adaptive image processing," Invited Key-note Address, Intl. Conf. on Robotics, Vision, and Parallel Processing for Industrial Vision, May 1994, Ipoh, Malaysia, pp 20-29 in the Technical Programme and Souvenir Magazine.
76. W.A. Rolston and R.M. Rangayyan, 1994, "Directional analysis of images using multi-resolution Gabor filters," Proc. Intl. Conf. on Robotics, Vision, and Parallel Processing for Industrial Vision, May 1994, Ipoh, Malaysia, pp 307-313.
75. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1994, "An adaptive filter for the study of VAG and VMG signals obtained in vivo during dynamic knee movement," 20th Canadian Medical & Biological Engineering Conf., Vancouver, BC, May 1994, pp 36-37.
74. L. Shen, Y. Shen, and R.M. Rangayyan, 1994, "Shape characterization and its applications," Proc. IEEE International Symposium on Speech, Image Processing, and Neural Networks, Hong Kong, April 1994, pp 9-12.
73. S.G. Elkadiki and R.M. Rangayyan, 1994, "Objective characterization of image acutance," Proc. SPIE vol. 2166 on Image Perception, 13-18 February 1994, Newport Beach, CA, pp 210-218.
72. Y.T. Zhang, S. Goldstein, C.B. Frank, G.D. Bell, and R.M. Rangayyan, 1993, "Effects of cyclic loading on vibroarthrographic signals in computer-controlled knee movement: A cadaver study," Proc. 15th Annual International Conference of the IEEE EMBS, San Diego, CA, Oct. 28-31, 1993, Editors: A.Y.Z. Szeto and R.M. Rangayyan, pp 1073-1074.
71. L. Shen, Y.P. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1993, "Measures of asymmetry in mammograms based upon the shape spectrum," Proc. 15th Annual International Conference of the IEEE EMBS, San Diego, CA, Oct. 1993, pp 48-49.
70. Y.P. Shen, R.M. Rangayyan, C.B. Frank, G.D. Bell, and Y.T. Zhang, 1993, "Time delay estimation for source localization of vibroarthrographic signals from human knee joints," Proc. 15th Annual International Conference of the IEEE EMBS, San Diego, CA, Oct. 28-31, 1993, Editors: A.Y.Z. Szeto and R.M. Rangayyan, pp 381-382.
69. Z.K. Moussavi, R.M. Rangayyan, C.B. Frank, G.D. Bell, K.O. Ladly, and Y.T. Zhang, 1993, "Statistical analysis of vibroarthrographic signals using the adaptive least squares method," Proc. Canadian Medical and Biological Engineering Society Conference, Ottawa, Ontario, 12-14 May 1993, pp 96-97.
68. Y.T. Zhang, C.B. Frank, G.D. Bell, Y.P. Shen, and R.M. Rangayyan, 1993, "Vibroarthrographic transfer function of the knee joint system during mechanical stimulation" Proc. Canadian Medical and Biological Engineering Society Conference, Ottawa, Ontario, 12-14 May 1993, pp 364-365.
67. J.A. Provine and R.M. Rangayyan, 1993, "Effect of Peanoscanning on Image Compression," Proc. SPIE Visual Information Processing II, vol. 1961, Orlando, FL, pp 152-159, April 15-16, 1993.
66. R. Bray, R. Rangayyan, and K. Eng, 1993, "A study of vascular behaviour in normal and healing medial collateral ligaments," 39th Annual Meeting, Orthopaedic Research Society, Feb. 1993, San Francisco, CA, p57.
65. R.M. Rangayyan, R.B. Paranjape, L. Shen, and J.E.L. Desautels, 1993, "A database for mammographic research," invited paper for panel discussion, Proc. IS&T/SPIE Conference on Biomedical Image Processing and Biomedical Visualization, vol. 1905, Feb. 1-5, 1993, San Jose, CA, pp 550-551.
64. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1993, "An automatic detection and classification system for calcifications in mammograms," Proc. IS&T/SPIE Conference on Biomedical Image Processing and Biomedical Visualization, vol. 1905, Feb. 1-5, 1993, San Jose, CA, pp 799-805. (invited paper).
63. R.B. Paranjape, R.M. Rangayyan, W.M. Morrow, and H.N. Nguyen, 1992, "Adaptive neighborhood image processing," Proc. SPIE vol. 1818, Visual Communication and Image Processing, Boston, MA, 18-20 Nov., 1992, pp 198-207.

62. G.R. Kuduvalli and R.M. Rangayyan, 1992, "Error-free transform coding by maximum-error-limited quantization of transform coefficients," Proc. SPIE vol. 1818, Visual Communication and Image Processing, Boston, MA, 18-20 Nov., 1992, pp 1458-1461.
61. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1992, "A knowledge-based position matching technique for mammographic calcifications," Proc. 14th Ann. Intl. Conf. IEEE EMBS, Paris, France, Oct. 1992, pp 1936-1937.
60. D. Boulfefel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1992, "Kalman restoration of SPECT images," Proc. 14th Annual International Conference of the IEEE EMBS, Paris, France, Oct. 29- Nov. 1, 1992, pp 1866-1867.
59. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1992, "Adaptive spectral analysis of nonstationary vibroarthrographic signals using autoregressive modelling," Proc. 14th Annual International Conference of the IEEE EMBS, Paris, France, Oct. 29- Nov. 1, 1992, pp 2566-2567.
58. Y.T. Zhang, W.A. Rolston, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1992, "Wavelet transform analysis of vibroarthrographic (VAG) signals obtained during dynamic knee movement," Proc. IEEE-SP International Symposium on Time-frequency and Time-scale Analysis, Oct. 4-6, 1992, Victoria, pp 235-238.
57. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1992, "Shape analysis of mammographic calcifications," Proc. 5th IEEE Symposium on Computer-Based Medical Systems, June 14-17, 1992, Durham, NC, pp 123-128.
56. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1992, "A model for the VMG-EMG relationship during isometric contraction of the human quadriceps muscle," Proc. 18th Canadian Medical and Biological Engineering Society Conference, Toronto, June 8-11, 1992, pp 22-23.
55. R.B. Paranjape, W.A. Rolston, and R.M. Rangayyan, 1992, "An examination of three high performance computing systems for image processing operations," Proc. Supercomputing Symposium, 7-10 June, 1992, Montreal, Canada, pp 208-218.
54. D. Boulfefel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1991, "Three-dimensional restoration of single photon emission computed tomography images," Proc. IEEE Nuclear Science Symposium and Medical Imaging Conference, 5-9 November 1991, Santa Fe, New Mexico, USA, pp 1986-1990.
53. G.R. Kuduvalli and R.M. Rangayyan, 1991, "Reversible image data compression for high-resolution digital teleradiology," Proc. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 13, No. 3, Orlando, Florida, USA, October 31- November 3, 1991, pp 1380-1381.
52. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1991, "A simultaneous comparison of vibromyography with electromyography during isometric contraction of the human quadriceps muscles," Proc. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 13, No. 3, Orlando, Florida, USA, October 31- November 3, 1991, pp 944-945.
51. K.O. Ladly, C.B. Frank, G.D. Bell, Y.T. Zhang, and R.M. Rangayyan, 1991, "The effect of leg weights on normal patellofemoral joint vibration signals," Combined meeting of the Orthopaedic Research Societies of USA, Japan, and Canada, October 21-23, 1991, Banff, Alberta, Canada, p 269.
50. R. Bray, K. Eng, R. Rangayyan, C. Frank, L. Ancomb, and P. Veale, 1991 "Quantitative assessment of ligament fine vascular anatomy," Combined meeting of the Orthopaedic Research Societies of USA, Japan, and Canada, October 21-23, 1991, Banff, Alberta, Canada, p99.
49. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1991, "A mathematical model for physiological patello-femoral crepitus," Proc. Canadian Medical and Biological Engineering Conference, Banff, Alberta, May 7-11, 1991, pp 149-150.
48. K. Eng, R.M. Rangayyan, R.C. Bray, and C.B. Frank, 1991, "A 3-step image processing algorithm for the analysis of ligament vascular anatomy," Proc. IASTED International Symposium on Computers, Electronics, Communication, and Control, Calgary, Alberta, Canada, April 8-10, 1991, pp 58-62.
47. W.M. Morrow, R.M. Rangayyan, and J.E.L. Desautels, 1990, "Feature-adaptive enhancement and analysis of high-resolution digitized mammograms," Proc. 12th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Philadelphia, November 1-4, 1990, pp 165-166.

46. S. Tavathia, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1990, "Analysis of knee sound signals using linear prediction," Proc. 12th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Philadelphia, November 1-4, 1990, pp 2148-2149.
45. Y.T. Zhang, K.O. Ladly, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1990, "Muscle contraction interference in acceleration vibroarthrography," Proc. 12th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Philadelphia, November 1-4, 1990, pp 2150-2151.
44. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1990, "Pre-reconstruction restoration versus post-reconstruction restoration of single photon emission computed tomography images," Proc. IEEE Colloquium in South America, Sept. 1990 (presented at conferences at Rio de Janeiro and Sao Paulo, Brazil; Buenos Aires, Argentina; Montevideo, Uruguay; and Santiago, Chile) pp 115-118.
43. Y.T. Zhang, R.M. Rangayyan, C.B. Frank, G.D. Bell, K.O. Ladly, and Z.Q. Liu, 1990, "Classification of knee sound signals using neural networks: A preliminary study," IASTED International Conference on Expert Systems and Neural Networks, August 15-17, 1990, Honolulu, Hawaii, pp 60-62.
42. G.R. Kuduvalli and R.M. Rangayyan, 1990, "Reversible image compression techniques for high-resolution digital teleradiology," IEEE Western Canada Conference and Exhibition on Telecommunication for Health Care: Telemetry, Teleradiology, and Telemedicine, July 6-7, 1990, Calgary, Canada, Proc. SPIE Vol. 1355, pp 173-178.
41. Y.T. Zhang, K.O. Ladly, Z.Q. Liu, S. Tavathia, R.M. Rangayyan, C.B. Frank, and G.D. Bell, 1990, "Interference in displacement vibroarthrography and its adaptive cancellation," Proc. Canadian Medical and Biological Engineering Society Conference, Winnipeg, June 9-12, 1990, pp 107-108.
40. W.M. Morrow and R.M. Rangayyan, 1990, "Implementation of adaptive neighbourhood image processing algorithms on a parallel supercomputer," Proc. Supercomputing Symposium '90, Montreal, June 4-6, 1990, Ed: M. Pelletier, pp 329-334.
39. Z.-Q. Liu, R.M. Rangayyan, and C.B. Frank, 1990, "Analysis of directional features in images using Gabor filters," Proc. 3rd IEEE Symp. Computer-Based Medical Systems, June 3-6, 1990, Chapel Hill, N.C., pp 68-74.
38. Z.-Q. Liu, Y.-T. Zhang, K. Ladly, C.B. Frank, R.M. Rangayyan, and G.D. Bell, 1990, "Reduction of interference in knee sound signals by adaptive filtering," Proc. 3rd IEEE Symp. Computer-Based Medical Systems, June 3-6, 1990, Chapel Hill, N.C., pp 389-396.
37. G.R. Kuduvalli and R.M. Rangayyan, 1990, "Linear Predictive Coding for Reversible Compression of Medical Images," Electronic Imaging West'90, Pasadena, 26 Feb.-1 Mar., 1990, pp 912-916.
36. Z.-Q. Liu, R.M. Rangayyan and C.B. Frank, "Linear Pattern Analysis using Scale-space Techniques," Proc. Supercomputing Symposium 1989, Toronto, June 1989, pp 111-123.
35. B.J. MacFarlane, P. Edwards, C.B. Frank, R. Rangayyan and Z.-Q. Liu, 1989, "Quantification of Collagen Remodeling in Healing Non-immobilized and Immobilized Ligaments," Proc. 35th Annual Meeting, Orthopaedic Research Society, February 6-9, 1989, Las Vegas, pp. 300.
34. Z.-Q. Liu, R.M. Rangayyan, C.B. Frank, 1988, "A Scale-Space Approach to Directional Analysis of Images," Proc. Canadian Conference on Electrical and Computer Engineering, Vancouver, Nov. 3-4, 1988, pp. 755-759.
33. R.M. Rangayyan, Z-Q. Liu, B.J. MacFarlane, P. Edwards, C.B. Frank, 1988, "Computerized quantification of collagen alignment in nonimmobilized and immobilized healing ligaments," Proc. IEEE Engineering in Medicine and Biology Society 10th Annual International Conference, New Orleans, November 4-7, 1988, pp 269-270.
32. R.M. Rangayyan, C.B. Frank, G.D. Bell and R. Smith, 1988, "Analysis of knee joint sound signals," Proc. IEEE Engineering in Medicine and Biology Society 10th Annual International Conference, New Orleans, November 4-7, 1988, pp 712-713.
31. T.C. Hon, R.M. Rangayyan, L.J. Hahn and R. Kloiber, 1988, "Restoration of Gamma Camera-based SPECT Images," Proc. Electronic Imaging'88 Conference, Anaheim, March 1988, pp. 507 - 512.

30. S. Chaudhuri, R.M. Rangayyan, S Walsh and C.B. Frank, 1987, "The Role of the Supercomputer in Image Processing: Quantitative Analysis of Collagen Alignment in Ligaments," Supercomputing Symposium, Calgary, June 1987, pp. 165-172.
29. S. Chaudhuri, R.M. Rangayyan, S. Walsh and C.B. Frank, 1987, "Quantitative Analysis of Ligament Healing via Directional Filtering," Proc. 13th Canadian Medical and Biological Engineering Conference, Halifax, June 1987, pp. 109-110.
28. R.M. Rangayyan and H.N. Nguyen, 1987, "Pixel-independent image processing techniques for noise removal and feature enhancement," IEEE Pacific Rim Conference on Communications, Computers, and Signal Processing, Victoria, BC, pp. 81-84.
27. R.M. Rangayyan and T. Hon, 1987, "Restoration of emission CT images," 13th Northeast Bioengineering Conference, (IEEE), Philadelphia, PA, pp. 16-18.
26. D.K. Mitchell and R.M. Rangayyan, 1987, "Restoration of limited-data seismic tomography images," Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing, Dallas, TX, pp. 2221-2224.
25. R.M. Rangayyan, 1987, "Multichannel phonocardiography for localization of heart sound sources," Proc. SPIE, Vol. 768, Intl. Symp. on Pattern Recognition and Acoustical Imaging, Newport Beach, CA, pp. 248-252.
24. R.M. Rangayyan and H. Nguyen, 1986, "Pixel-independent Image Processing Techniques for Enhancement of Features in Mammograms," Proc. 8th IEEE Engineering in Medicine and Biology Conf., Fort Worth, TX, pp. 1113-1117.
23. Nguyen, H., R. Rangayyan, S. Walsh, C. Frank, 1986, "Directional Filtering for Quantification of Collagen Alignment in Normal Ligaments," Proc. of 12th Northeast Bioengineering Conference, Yale University, New Haven, Connecticut, pp. 141-144.
22. R.J. Lehner and R.M. Rangayyan, 1985, "Microcomputer system for quantification of the phonocardiogram," IEEE-EMBS Frontiers of Engineering and Computing in Health Care, Chicago, September, 1985, pp. 849-854.
21. R. Lehner and R.M. Rangayyan, 1984, "Use of the carotid pulse in identification of the second heart sound," International Conference on Computers, Systems, and Signal Processing, IEEE Indian Institute of Science, Bangalore, India, December 1984, pp. 1414-1417.
20. R.M. Rangayyan, A.P. Dhawan and R. Gordon, 1984, "Algorithms for limited-view computed tomography: A survey," International Conference on Computers, Systems, and Signal Processing, IEEE Indian Institute of Science, Bangalore, India, December 1984, pp. 1540-1545, INVITED PAPER.
19. A.P. Dhawan, R. Gordon and R.M. Rangayyan, 1984, "Computed tomography by transillumination to detect early melanoma," IEEE Frontiers of Engineering and Computing in Health Care, Los Angeles, CA, September 1984, pp. 518-522.
18. A.P. Dhawan, R.M. Rangayyan and R. Gordon, 1984, "Image restoration by two-dimensional deconvolution in limited-view computed tomography," Optical Society of America topical meeting on "Industrial Applications of Computed Tomography and NMR Imaging," Hecla Island, Manitoba, Canada, Aug. 1984, pp Tu A5-1 to Tu A5-3.
17. A.P. Dhawan, R.M. Rangayyan and R. Gordon, 1984, "Wiener filtering for deconvolution of geometric artifacts in limited-view image reconstruction," IEEE Computer Society International Symposium on Medical Images and Icons, Arlington, July 1984, pp. 168-172.
16. R. Lehner and R.M. Rangayyan, 1983, "A microcomputer system for quantitative analysis of the phonocardiogram," Proc. MEDCOMP-83 (IEEE), Athens, September.
15. R. Gordon, R.M. Rangayyan, D.H. Wardrop and T.M. Beeman, 1983, "Improving image quality in teleradiology and tele-computed tomography," Proc. IEEE Systems, Man, and Cybernetics Society Conference, December 30, 1983 - January 7, 1984, Bombay/New Delhi, pp. 908-913.
14. R. Gordon and R.M. Rangayyan, 1983, "Radiographic feature enhancement, information content, and dose reduction in mammography and cardiac angiography," Proc. 5th Annual Conference on Frontiers of Engineering and Computing in Health Care (IEEE-EMBS), Columbus, September, 8.4.1-8.4.5.

13. R.M. Rangayyan and R. Gordon, 1983, "Geometric deconvolution of artifacts in limited view computed tomography," Digest of Optical Society of America topical meeting on "Signal recovery and synthesis with incomplete information and partial constraints," Incline Village, Nevada, January 12-14, FA2-1: FA2-3.
12. R. Gordon and R.M. Rangayyan (M.R. Rangaraj), "Computed tomography from a few ordinary radiographs," Proc. of IEEE COMPMED-82, Philadelphia, Sept. 1982, pp. 54-58.
11. R. Gordon and R.M. Rangayyan (M.R. Rangaraj), "Experiments on streak prevention in image reconstruction from a few views," Proc. 4th National Conference of Canadian Society for Computational Studies of Intelligence, Saskatoon, May 1982, pp. 41-47.
10. R.M. Rangayyan (M.R. Rangaraj) and R. Gordon, 1982, "Computed tomography for remote areas via teleradiology," Proc. SPIE, Vol. 318, pp. 182-185, Proc. 1st Intl. Conf. on Picture Archival and Communication Systems for Medical Applications, Newport Beach, Jan. 18-21.
9. R. Gordon and R.M. Rangayyan (M.R. Rangaraj), 1981, "The need for cross-fertilization between the fields of profile inversion and computed tomography," Proc. Seventh Canadian Symposium on Remote Sensing, Winnipeg, pp. 538-540, September.
8. I.S.N. Murthy and R.M. Rangayyan (M.R. Rangaraj), 1978, "Homomorphic deconvolution of EMG signals," Proceedings of VII All India Symposium on Biomedical Engineering, Hyderabad, India, pp. S.4-1 to S.4-4, June.
7. R.M. Rangayyan (M.R. Rangaraj) and D. Narayana Dutt, 1978, "Speech processing techniques for the analysis of heart sounds, Proceedings of VII All India Symposium on Biomedical Engineering, Hyderabad, India, pp. S.4-9 to S.4-12.
6. I.S.N. Murthy, R.M. Rangayyan (M.R. Rangaraj) and K.J. Udupa, 1978, "R-R interval determination by cepstrum techniques," Proceedings of VII All India Symposium on Biomedical Engineering, Hyderabad, India, pp. S.4-15 to S.4-18.
5. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1978, "Classification of PCG via pole-zero modelling," Proceedings of VII All India Symposium on Biomedical Engineering, Hyderabad, India, pp. S.7-26 to S.7-29.
4. I.S.N. Murthy, R.M. Rangayyan (M.R. Rangaraj), K.S. Prabhu and A.K. Goyal, 1978, "ECG waveform typing for PVC detection," Intl. Symp. and Workshop on Biomedical Engineering, New Delhi, India, pp. 110-111, February.
3. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1978, "Cepstral filtering of phonocardiogram signal," Intl. Symp. and Workshop on Biomedical Engineering, New Delhi, India, pp. 118-119.
2. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1977, "Analysis and modelling of phonocardiogram," Proc. First Mediterranean Conf. Medical and Biological Engineering, Sorrento, Italy, pp. 8-53 to 8-56, September.
1. K.J. Udupa, I.S.N. Murthy and R.M. Rangayyan (M.R. Rangaraj), 1977, "Epoch analysis of ECG and PCG signals," Proc. First Mediterranean Conf. Medical and Biological Engineering, Sorrento, Italy, pp. 8-57 to 8-60.

G. Communications (lectures, tutorials, displays, abstracts) at Conferences and Workshops

88. "Computer-aided Diagnosis: Engineering Improved Health Care," XVI Semana Brasileira de Informática Biomédica, Universidade de São Paulo, Ribeirão Preto. 17-19 September 2018.
87. "Computer-aided Diagnosis: Engineering Improved Health Care" and "Classification of Benign and Malignant Vertebral Compression Fractures in Magnetic Resonance Images," Invited Lectures, XXIII Brazilian Congress of Medical Physics, IX Gaúcho Medical Physics Meeting, and IV South Brazilian Symposium of Medical Physics, Porto Alegre, RS, Brazil, 5-8 September 2018.
86. "Engineering Education: Preparing Professionals for the Betterment of Humanity." Keynote Address, 13 January 2018, International Conference on Current Trends in Higher Education, Adamas University, Kolkata, West Bengal, India.
85. Chief Guest, invited address to graduating students at PES College of Engineering, Mandya, Karnataka, India, 12 August 2017.

84. Invited inaugural address as Chief Guest on "Current trends in biomedical image and signal processing," and Keynote Address on "Computer-aided Diagnosis of Retinopathy of Prematurity," International Conference on Signal Processing and Communication, Karunya University, Coimbatore, Tamil Nadu, India, 28-29 July 2017.
83. Computer-aided Diagnosis: Engineering Improved Health Care, Meeting of the Royal Society of Canada, November 2016, Kingston, ON, Canada.
82. Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms, Keynote talk, International Conference on Signal and Information Processing (IConSIP-2016), October 2016, Nanded, Maharashtra, India.
81. Tutorial on analysis of texture and oriented patterns in biomedical images, European Conference on Signal Processing EUSIPCO 2016, Budapest, Hungary, 29 August - 2 September 2016.
80. Invited Speaker, 2nd International Conference on Control, Instrumentation, Energy & Communication (CIEC 16), January 28-30, 2016, Department of Applied Physics, University of Calcutta, Calcutta, India.
79. Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms, IEEE CBMS 2015, Sao Carlos, Brazil, June 2015, Keynote Lecture.
78. Analysis of Texture and Oriented Patterns, IEEE CBMS 2015, University of Sao Paulo Ribeirao Preto, Brazil, June 2015.
77. Analysis of Shape, IEEE CBMS 2015, University of Sao Paulo Ribeirao Preto, Brazil, June 2015.
76. Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms, Our Genes Conference, Hereditary Breast and Ovarian Cancer Society, Edmonton, Alberta, September 2014.
75. Invited lectures (six hours) on "Oriented tissue analysis in medical imaging," IEEE EMBS 11th International Summer School on Biomedical Imaging, St. Jacut de la Mer, Bretagne, France, June 2014.
74. Invited keynote speech, "Digital Image Processing and Pattern Recognition Techniques for the Analysis of Fundus Images of the Retina," IEEE 5th Biosignals and Biorobotics Conference, Salvador, Bahia, Brazil, May 2014.
73. Invited Plenary Speech, "Computer-aided Detection, Modeling, and Analysis of Retinal Vascular Architecture for the Diagnosis of Retinopathy," IEEE International Conference on e-Health and Bioengineering, Iasi, Romania, November 2013, Iasi, Romania, November 2013.
72. Keynote Speech, "Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms," IASTED International Conference on Signal and Image Processing, Banff, Alberta, Canada, July 2013.
71. J. Chakraborty, S. Mukhopadhyay, R. M. Rangayyan, and V. Karale, "Computer-aided Detection of Mammographic Lesions," Shastri Indo-Canadian Institute, New Delhi, India, June 2013.
70. Special Guest and Invited Keynote Speaker, "Computer-aided Detection, Modeling, and Analysis of Retinal Vascular Architecture for the Diagnosis of Retinopathy," at the International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT-12), Golden Jubilee Celebrations of the P.E.S. College of Engineering, Mandya, India, December 2012.
69. Invited lectures on Analysis of Shape in Biomedical Images; Computer-aided Detection, Modeling, and Analysis of Retinal Vascular Architecture for the Diagnosis of Retinopathy; Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms; and Color Image Processing with Biomedical Applications; at Workshop on Selected Topics in Medical Imaging, IEEE Communications and Signal Processing Societies Joint Chapter and University College of Engineering, Osmania University, Hyderabad December 2012.
68. Invited lecture on "Color Image Processing with Biomedical Applications," Workshop on Image and Speech Processing, C.R. Rao Advanced Institute of Mathematics, Statistics, and Computer Science, and the International Institute of Information Technology, Hyderabad, December 2012.
67. Invited lectures at Workshop on Biomedical Signal Analysis, IIT, Roorkee, India, December 2012.

66. Invited Plenary Lecture on "Computer-aided Detection of Subtle Signs of Early Breast Cancer: Detection of Architectural Distortion in Mammograms," International Conference on Biomedical Engineering and Assistive Technologies (BEATS 2012), Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, India, December, 2012.
65. Invited lectures at Workshop on Medical Image and Signal Processing and presented two seminars on "Color Image Processing with Biomedical Applications" and "Computer-aided Detection of Subtle Signs of Breast Cancer in Mammograms," IIT Guwahati, December, 2012.
64. Invited lectures at Workshop on Medical Imaging, IIT Kharagpur, India, on "Introduction to Medical Imaging," "Digital Image Processing Techniques for Ophthalmology," and "Computer-aided detection of architectural distortion in mammograms," December, 2012.
63. Plenary Lecture on "Computer-aided Detection, Modeling, and Analysis of Retinal Vascular Architecture for Diagnosis of Retinopathy," XXIII Congresso Brasileiro em Engenharia Biomédica – XXIII CBEB, Porto de Galinhas, PE, October 2012.
62. Panelist, Panel Discussion Session on "Clinical needs, clinical evaluation, technical evaluation, and technical requirements for development of practical CAD systems," 26th International Congress and Exhibition on Computer Assisted Radiology and Surgery, Pisa, Italy, June 2012.
61. Invited talk on "CAD techniques for the detection of architectural distortion in mammograms," 26th International Congress and Exhibition on Computer Assisted Radiology and Surgery, Pisa, Italy, June 2012.
60. Organized a panel discussion session on "Considerations in the Design of Advanced Technological Systems for Health Care in India" for the conference on "Engaging India: Human and Social Dimensions of Science and Technology," Shastri Indo-Canadian Institute, June, 2012, Calgary, Alberta, Canada, including a presentation on "Considerations in the Design of Systems for Computer-aided Diagnosis for Health Care in India," with contributions by S. Mukhopadhyay, P. Bhattacharyya, A. Sadhu, A. Gupta, and R. Bansal.
59. Invited Centenary Lecture, Department of Electrical Engineering, Indian Institute of Science, Bangalore, India, on "Computer-aided Detection of Early Signs of Breast Cancer in Mammograms," May 2012.
58. Invited lecture, "Mathematical Models and Methods for the Detection of Diverging and Spiculating Patterns in Medical Images," VIII International Conference on Stochastic Geometry, Convex Bodies, Empirical Measure, and Applications to Mechanics Engineering of Train Transport, Taormina, Sicily, Italy, September 2011.
57. Invited member in a special panel discussion session on "Clinical needs, clinical evaluation, technical evaluation, and technical requirements for the development of practical CAD systems," Computer Assisted Radiology and Surgery, Berlin, Germany, June 2011.
56. Invited Keynote Lecture on "Computer-aided detection of subtle signs of early breast cancer: Detection of architectural distortion in mammograms," Canadian Medical and Biological Engineering Conference, Toronto, ON, Canada, June 2011.
55. Invited Plenary Lecture on "Digital Image Processing and Pattern Recognition Techniques for the Analysis of Fundus Images of the Retina," IEEE International Symposium on Medical Measurements and Applications, Bari, Italy, May 2011.
54. Invited Tutorial, "Digital image processing in biomedical image analysis," at the All India Council for Technical Education Workshop on Medical Imaging, Indian Institute of Technology, Kharagpur, India, 3-7 January 2011.
53. Invited Tutorial, "Computer-Aided Diagnosis of Breast Cancer: Towards the Detection of Early and Subtle Signs," at the All India Council for Technical Education Workshop on Medical Imaging, Indian Institute of Technology, Kharagpur, India, 3-7 January 2011.
52. Invited Tutorial, "Three-dimensional Image Processing Techniques for Landmarking and Segmentation of Computed Tomographic Images," at the All India Council for Technical Education Workshop on Medical Imaging, Indian Institute of Technology, Kharagpur, India, 3-7 January 2011.
51. Invited Tutorial, "Digital Image Processing Techniques for the Detection and Analysis of Diagnostic Features in Fundus Images of the Retina," at the International Conference on Communication, Computers and Devices (ICCCD), Indian Institute of Technology, Kharagpur, India, 9 December 2010.

50. Invited Tutorial, "Computer-Aided Diagnosis of Breast Cancer: Towards the Detection of Early and Subtle Signs," at the Quality Improvement Programme Workshop on Medical Signal & Image Processing, Electrical Engineering Department, Indian Institute of Technology, Roorkee, India, 15 December 2010.
49. Invited Tutorial, "Three-dimensional Image Processing Techniques for Landmarking and Segmentation of Computed Tomographic Images," at the Quality Improvement Programme Workshop on Medical Signal & Image Processing, Electrical Engineering Department, Indian Institute of Technology, Roorkee, India, 15 December 2010.
48. Invited Plenary Talk, "Computer-aided detection of subtle signs of early breast cancer: Detection of architectural distortion in mammograms," at the International Conference on Biomedical Engineering and Assistive Technologies, National Institute of Technology, Jalandhar, India, 18 December 2010.
47. Invited tutorial, "Computer-Aided Diagnosis of Breast Cancer: Towards the Detection of Early and Subtle Signs," Third International Symposium on Applied Sciences in Biomedical and Communication Technologies, ISABEL 2010, Rome, Italy, 7 November 2010.
46. Plenary lecture, "Three-dimensional image processing techniques for landmarking and segmentation of computed tomographic images," First Workshop on Scientific Computing in Health Applications, National Institute of Science and Technology in Medicine Assisted by Scientific Computing, National Laboratory for Scientific Computing, Petrópolis, RJ, Brazil, June 2010.
45. Invited lecture, "CAD for detection of architectural distortion in prior mammograms," Computer Assisted Radiology and Surgery, Geneva, Switzerland, June 2010.
44. Invited lecture, "Detection of architectural distortion in prior mammograms using Gabor filters, phase portraits, fractal analysis, and texture analysis," *Techniche di Analisi Frattale – Applicazione alla mammografia*, Bari, Italy, 23 April 2009.
43. P.M. de Azevedo-Marques, N.A. Rosa, A.J.M. Traina, C. Traina Junior, S.K. Kinoshita, and R.M. Rangayyan, "Reducing the Semantic Gap in Content-based Image Retrieval in Mammography with Relevance Feedback and Inclusion of Expert Knowledge," poster and abstract in *Proc. Computer Assisted Radiology and Surgery*, Barcelona, Spain, June 2008. Springer. *International Journal of Computer Assisted Radiology and Surgery*, vol. 3, Suppl. 1, page S382.
42. R.M. Rangayyan, "Detection of architectural distortion in prior mammograms using Gabor filters, phase portraits, fractal analysis, and texture analysis," Fifth International Symposium on Fractals in Biology and Medicine, 12-15 March, 2008, Locarno, Switzerland, one-page abstract in program.
41. R.M. Rangayyan, invited lecture, "Fractal diagnosis of breast tumours from radiographic images," Fifth International Symposium on Fractals in Biology and Medicine, 12-15 March, 2008, Locarno, Switzerland, one-page abstract in program.
40. R.M. Rangayyan, invited lecture, "Computer-Aided Diagnosis of Breast Cancer: Towards the Detection of Early and Subtle Signs," II Workshop de Telessaude, Universidade Estadual de Ciências da Saúde de Alagoas, Maceió, AL, Brasil, October 2007.
39. R.M. Rangayyan, invited talk and panel discussion on "Education in Biomedical Engineering: crossing professional and national boundaries," 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 2007, Lyon, France.
38. "Computer-aided Diagnosis - CAD - (Diagnóstico Auxiliado por Computador – CAD)," *Câncer de mama: Epidemiologia, diagnóstico e tratamento*, Centro de Ciências das Imagens e Física Médica, Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, SP, Brasil, February 2006.
37. R.M. Rangayyan, Keynote address on "Computer-aided detection of signs of early breast cancer," at the Third IEEE International Seminar on Medical Applications of Signal Processing, London, UK, 3 – 4 November 2005.
36. R.M. Rangayyan, F.J. Ayres, and J.E.L. Desautels, "Computer-aided diagnosis of early breast cancer: Detection of signs of architectural distortion," Invited talk and abstract in program booklet, Workshop on Alternatives to Mammography, Copenhagen, Denmark, September, 2005.

35. R.M. Rangayyan, F.J. Ayres, and J.E.L. Desautels, "Computer-aided diagnosis of breast cancer: Toward the detection of early and subtle signs," The First World Experts' Congress on Women's Health Medicine and Healthcare, World Academy of Biomedical Technologies, Paris, France, 14 pages, Invited talk, March 2005.
34. R.M. Rangayyan, H. Alto, N.R. Mudigonda, and J.E.L. Desautels, "Content-based retrieval and analysis of breast masses in mammograms," one-page summary on CDROM, paper no. 1170, World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, August 2003.
33. R.M. Rangayyan, "Computer-aided diagnosis of breast cancer," XIII Brazilian Symposium on Computer Graphics and Image Processing, Gramado, Rio Grande do Sul, Brazil, October, 2000.
32. R.M. Rangayyan, "Computer-aided diagnosis of breast cancer," Congresso Brasileiro de Engenharia Biomédica, Florianópolis, Santa Catarina, Brazil, September, 2000.
31. N.R. Mudigonda, R.M. Rangayyan, J.E.L. Desautels, and O. Menut, "Segmentation of breast masses in mammograms: A multi-resolution and hierarchical density propagation approach," Proc. 13th Annual International Conference and Exhibition on Computer Assisted Radiology and Surgery, Paris, France, 23-26 June 1999, p 1014.
30. R.M. Rangayyan, "High-performance computing for computer-aided diagnosis of breast cancer," High-performance Computing Symposium, Kingston, ON, June 1999.
29. R.M. Rangayyan and N.R. Mudigonda, "Perception-based measures for computer-aided analysis of mammograms," Proc. Eighth Far West Image Perception Conference, Morley, AB, May 1999, p 4.
28. R.M. Rangayyan, Presentation on "Computer-aided diagnosis of breast cancer," opening ceremony of the Multimedia Advanced Computational Infrastructure (MACI) facility at the Rozsa Centre, University of Calgary, 28 September 1998.
27. R.M. Rangayyan, Member of Panel Discussion on "Info Era," Fenasoftware, São Paulo, Brazil, 21 July 1998.
26. R.M. Rangayyan, N.M. El-Faramawy, J.E.L. Desautels, and O.A. Alim, 1997, "Measures of acutance and shape for classification of breast tumors," Shape Modeling International '97, Aizu-Wakamatsu, Japan, 3-6 March 1997.
25. C.B. Frank, Y.T. Zhang, G.D. Bell, K.O. Ladly, and R.M. Rangayyan, 1994, "Effects of joint angular velocity on vibroarthrographic signals in evaluation of knee function and pathology," abstract PS05-1.15, p128, World Congress on Medical Physics and Biomedical Engineering, 21-26 August 1994, Rio de Janeiro, Brazil.
24. Y.T. Zhang, Y.P. Shen, C.B. Frank, G.D. Bell, K.O. Ladly, and R.M. Rangayyan, 1994, "Modeling of vibroarthrographic transfer function for the knee joint system: A cadaver study," abstract PS05-1.8, p124, World Congress on Medical Physics and Biomedical Engineering, 21-26 August 1994, Rio de Janeiro, Brazil.
23. R.M. Rangayyan, C.B. Frank, Y.T. Zhang, and K.O. Ladly, Exhibit on Knee Sounds for the Sport Science Exhibits at the Edmonton Space and Science Centre, presented in March 1994.
22. D. Boulfelfel, R.M. Rangayyan, L.J. Hahn, and R. Kloiber, 1993, "Three-dimensional restoration of single photon emission computed tomography images using a Kalman-Metz filter," CT'93, International Symposium on Computerized Tomography, Novosibirsk, Russia, 10-14 August 1993, p33.
21. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1993, "Computer detection and analysis of mammographic calcifications," presented at the Biennial Meeting of the International Association for Breast Cancer Research, April 1993, Banff, Alberta.
20. L. Shen, R.M. Rangayyan, and J.E.L. Desautels, 1992, "Shape analysis of mammographic calcifications," 55th Annual Scientific Meeting of the Canadian Association of Radiologists, Halifax, 21-25 June 1992, p.88.
19. R.M. Rangayyan, "Region-based enhancement and analysis of mammograms," lecture presented at the 13th Ann. Intl. Conf. IEEE Engineering in Medicine and Biology Society, Orlando, Florida, USA, Oct. 1991.
18. Y.T. Zhang, C.B. Frank, R.M. Rangayyan, G.D. Bell, and K.O. Ladly, "Step size optimization of nonstationary adaptive filtering for knee sound signal analysis," Proc. World Congress on Medical Physics and Biomedical Engineering, Kyoto, Japan 7-12, July 1991, (Medical and Biological Engineering and Computing, Vol. 29, Supplement 1991), p 836.

17. K. Eng, R.M. Rangayyan, P. Veale, R.C. Bray, C.B. Frank, and L. Anscorb, "Image processing techniques for analysis of the vascular structure of ligaments" Proc. World Congress on Medical Physics and Biomedical Engineering, Kyoto, Japan, July 1991, (Medical & Biological Engineering & Computing, Vol. 29, Suppl. 1991), p 836.
16. R.C. Bray, P. Veale, K. Eng, R. Rangayyan, C. Frank, "Quantitative analysis of ligament vascularity by image analysis," The Canadian Orthopaedic Association and The Canadian Orthopaedic Research Society Annual Meeting, Calgary, 2-6 June 1991, p25:20.
15. W.M. Morrow, R. Paranjape, R.M. Rangayyan, and J.E.L. Desautels, "Region-based image processing with applications in mammography," Annual Meeting - Canadian Association of Radiologists, Hamilton, June 1991.
14. R.M. Rangayyan, two invited seminars: "A tutorial on computed tomography," and "Image processing techniques for quantitative analysis of ligament healing and treatment procedures" at the conference "Jornada EPUSP/IEEE em Computação Visual," University of São Paulo, São Paulo, Brazil, 4-7 December, 1990.
13. Y.T. Zhang, K.O Ladly, S. Tavathia, C.B. Frank, R.M. Rangayyan, and G.D. Bell, Display on "Knee Sound Analysis" at the "University of Calgary Science and Technology Week," Health Sciences Centre, Calgary, 20 October 1990.
12. Y.T. Zhang, K.O Ladly, S. Tavathia, C.B. Frank, R.M. Rangayyan, and G.D. Bell, Display on "Joint Sounds" at "Chautauqua: The Science Circuit," Science Alberta Foundation, Calgary, 12-13 October 1990.
11. R.M. Rangayyan, "Introduction," IEEE Western Canada Conference and Exhibition on Telecommunication for Health Care: Telemetry, Teleradiology, and Telemedicine, July 6-7, 1990, Calgary, Canada, Proc. SPIE Vol. 1355, p vi.
10. R.M. Rangayyan, Attendee (by invitation), Franco-Canadian Colloquium on "Telecommunications, Optoelectronics, Image and Signal Processing," organized by the Conference des Grandes Ecoles (France) and the National Committee of Deans of Engineering and Applied Sciences (Canada), Montpellier, France, 10-15 December 1989.
9. R.M. Rangayyan, invited talk on "Approaches to teleradiology in Alberta," and participated in a panel discussion at "Executive Symposium on Telehealth," University of Victoria, 7 November 1989.
8. R.M. Rangayyan, "Digital image processing techniques for quantitative analysis of ligament healing and treatment methods," Electronic Imaging West '89, Pasadena, 10-13 April 1989.
7. R.M. Rangayyan, "Restoration of Nuclear Medicine Images," "Digital Image Processing - A Tutorial" and "Computed Tomography - A Tutorial," Symposium and Workshop on Advances in Imaging and Image Processing, B.A.R.C., Bombay, India, December, 1988.
6. A.P. Dhawan, R. Gordon and R.M. Rangayyan, 1984, "Image restoration in limited-view computed tomography," 70th Scientific Assembly of the Radiological Society of North America, November 25-30, 1984, Washington, D.C.
5. R.M. Rangayyan, 1984, "Tutorial on iterative and object-dependent algorithms for limited-view computed tomography," Optical Society of America. Topical meeting on "Industrial Applications of computed Tomography and NMR Imaging," Hecla Island, Manitoba.
4. R. Gordon and R.M. Rangayyan, 1982, "Computed tomography for remote areas via digital teleradiology," Proc. of 45th Annual Meeting of Canadian Assoc. of Radiologists, Winnipeg, p. 179.
3. R.M. Rangayyan and R. Gordon, 1982, "Expanding the dynamic range of x-ray video-densitometry for digital mammography and teleradiology," Proc. of 45th Annual Meeting of Canadian Assoc. of Radiologists, Winnipeg, p. 189.
2. R.M. Rangayyan (M.R. Rangaraj) and I.S.N. Murthy, 1980, "On the use of signal length criterion for quantification of PCG signal features," MATSCIENCE Conference, Mysore, March.
1. I.S.N. Murthy and R.M. Rangayyan (M.R. Rangaraj), 1979, "Extraction of action potential from surface EMG," ICS-79 Salzburg, Austria, September.

H. Other Publications

6. Z.Q. Liu, R.M. Rangayyan, and C.B. Frank, 1990, "Linear pattern analysis using scale-space techniques," *The Big Byte*, University of Calgary, vol. 23, no. 5, November, 1990, pp 4-7.
5. D. Boulfelfel, R.M. Rangayyan, J.A.R. Blais, and L.J. Hahn, 1990, "Nuclear medicine image processing," *The Big Byte*, University of Calgary, vol. 23, no. 5, November, 1990, pp 8-10.
4. G.R. Kuduvalli and R.M. Rangayyan, 1990, "Linear predictive coding techniques for reversible compression of medical images," *The Big Byte*, University of Calgary, vol. 23, no. 4, July 1990, pp 12-15.
3. W.M. Morrow and R.M. Rangayyan, 1990, "High-resolution image processing on the Myrias SPS-2," *The Big Byte*, University of Calgary, vol. 23, no. 4, July 1990, pp 9-11.
2. R.M. Rangayyan, 1988, "An introduction to Indian classical music," *Canadian Music Educator*, Vol. 29, No. 4, October 1988, pp. 27-33.
1. S. Chaudhuri, R.M. Rangayyan, S. Walsh, and C. Frank, 1987, "The Role of the Supercomputer in Image Processing: Quantitative Analysis of Collagen Alignment in Ligaments," *Super*C*, Super Computing Services, University of Calgary, pp. 4-9 (invited feature article).

I. Research Reports

6. T. Strecker, R. Rangayyan and L.E. Turner, 1985, "A digital image acquisition and processing system," Report #25 CO TSRRLT 1985, Department of Electrical Engineering, University of Calgary.
5. R. Gordon, R.M. Rangayyan and D.W. MacEwan, 1982, "Digital mammography for the National breast screening study," Progress Report submitted to the Manitoba Medical Services Foundation, August.
4. V.V.S. Sarma and R.M. Rangayyan (M.R. Rangaraj), 1980, "Pattern classification techniques for speech decryption," Research Report for DRDO project "SPAN," School of Automation, Indian Institute of Science, Bangalore, October.
3. V.V.S. Sarma and R.M. Rangayyan (M.R. Rangaraj), 1980, "Speech analysis and synthesis by linear prediction: A state-of-the-art report," Research Report for DRDO project "SPAN," School of Automation, Indian Institute of Science, Bangalore, April.
2. I.S.N. Murthy and R.M. Rangayyan (M.R. Rangaraj), 1978, "New concepts for PVC detection" and "New techniques for PCG analysis," Department of Electrical Engineering, Indian Institute of Science, Bangalore, September.
1. I.S.N. Murthy, R.M. Rangayyan (M.R. Rangaraj), K.J. Udupa, A.K. Goyal and K.S. Prabhu, "Biosignal processing techniques and hardware," Research Report and Documentation Manual on "Homomorphic analysis and modelling of ECG signals," Dept. of Electrical Engineering, Indian Institute of Science, Bangalore, India, July 1977.

J. Awards and Distinction

Fellow, Royal Society of Canada, 2016.

Outstanding Teaching Performance Award, Schulich School of Engineering, University of Calgary, 2016.

"Guest of Honor," Third International Conference on Signal Processing and Integrated Networks SPIN 2016, Amity University, Noida, India, February 2016.

"Honorary Professor," Amity University, Noida, India, February 2016.

"Pride of Canada: For making Canadian Kannadigas proud through your outstanding achievement in your field of profession and personal services to the community at large," Canadian Organization of Kannadigas and Kannada Sangha, Toronto, 2014.

"High-level Foreign Expert Visiting Professor," 2014, High-level Foreign Expert Visiting Professor, State Administration of Foreign Experts Affairs and Xiamen University, Xiamen, Fujian, China.

"Diploma of Honor", IEEE International Conference on eHealth and Bioengineering, EHB, Iași, Romania, November 2013.

"Outstanding Engineer" medal, IEEE Canada, 2013.

"Achievement in Innovation," Innovate Calgary, February 2013.

Distinguished Alumni Award, International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT-12), held in connection with the Golden Jubilee Celebrations of the P.E.S. College of Engineering, Mandya, India, 21-22 December 2012.

Award of Honour, International Conference on Biomedical Engineering and Assistive Technologies (BEATS 2012), held in connection with the Silver Jubilee Celebrations of the Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, India, 6-7 December, 2012.

Invited Centenary Lecturer, Department of Electrical Engineering, Indian Institute of Science, Bangalore, India, May 2012.

Guest of Honour, International Conference on Biomedical Engineering and Assistive Technologies, National Institute of Technology, Jalandhar, India, 17 December 2010.

Faculty Mobility Program Award of the Shastri Indo-Canadian Institute, 2010-2011.

Fellow, Canadian Academy of Engineering, 2009.

Killam Resident Fellowship, University of Calgary, 2007.

Fellow, Canadian Medical and Biological Engineering Society, 2007.

Fellow, Society for Imaging Informatics in Medicine, 2007.

"University Professor," University of Calgary (2003 – present).

Distinguished Lecturer, IEEE Engineering in Medicine and Biology Society, 2009-2011

Fellow of SPIE: International Society for Optical Engineering, 2003.

Fellow of AIMBE: American Institute for Medical and Biological Engineering, 2003.

Killam Resident Fellowship, University of Calgary, 2002.

Distinguished Lecturer, University of Toronto, 2002.

Excellence in Professional Field Award, India-Canada Association of Calgary, 2002.

Fellow of EIC: Engineering Institute of Canada, 2002.

Research Excellence Award, Department of Electrical and Computer Engineering, University of Calgary, 2001.

Fellow of IEEE: Institute of Electrical and Electronics Engineers, 2001.

IEEE Third Millennium Medal, 2000.

Killam Resident Fellowship, University of Calgary, 1998.

Research Excellence Award, Department of Electrical and Computer Engineering, University of Calgary, 1997.

Research Excellence Award, Faculty of Engineering, University of Calgary, 1997.

Outstanding Service Award, India-Canada Association of Calgary, 1997.

Distinguished Lecturer, Hong Kong Institution of Engineers, 1996.

Promoted to Senior Member grade in IEEE, 1983.

First prize in All India Student paper contest conducted by IEEE India Council, Bombay, February 1979.

First prize in Student paper contest conducted by IEEE Bangalore Section, February 1979.

Third prize in All India Student paper contest conducted by IEEE India Council, Madras, February 1978.

Second prize in Student paper contest conducted by IEEE Bangalore Section, January 1978.

Best Cadet, National Cadet Corps, 1976 (Served 1970-1976).

Seventh Rank holder, University of Mysore Bachelor of Engineering Examinations, 1976.

Government of India National Merit Scholar, 1970-76.

K. Institutions Visited to Provide Lectures and Courses (Outside Canada)

Universidade de São Paulo, São Paulo, SP, Brasil

Universidade Federal de São Carlos, São Carlos, SP, Brasil

Universidade de São Paulo, São Carlos, SP, Brasil

Universidade de São Paulo, Ribeirão Preto, SP, Brasil

Universidade Estadual de Ciências da Saúde de Alagoas,
Maceió, AL, Brasil

Universidade Federal de Alagoas, Maceió, AL, Brasil

Universidade Estadual de Campinas, Campinas, SP, Brasil

Universidade Federal de Uberlândia, Uberlândia, MG,
Brasil

Radioclínica, Uberlândia, MG, Brasil

Instituto do Coração, São Paulo, SP, Brasil

Instituto da Criança, São Paulo, SP, Brasil

Universidade Estadual Paulista, Sorocaba, SP, Brasil

Faculdade de Engenharia de Sorocaba, Sorocaba, SP,
Brasil

Laboratório Nacional de Computação Científica,
Petrópolis, RJ, Brasil

Universidade Federal do Pernambuco, Recife, PE, Brasil

Universidade Federal do Rio Grande do Sul, RS, Brasil

Faculdade SENAC de Ciências Exatas e Tecnologia,
(SENAC College of Computational Sciences and
Technology), São Paulo, SP, Brasil

University of Zimbabwe, Harare, Zimbabwe

Universidad de Sevilla, Sevilla, Spain

École Nationale Supérieure des Télécommunications de
Bretagne, Brest, France

Université de Paris VI, Paris, France

Institut Polytechnique de Lyon, Lyon, France

Université de Savoie, Annecy, France

Université de Rennes, Rennes, France

University of Zagreb, Zagreb, Croatia

University of Bari, Italy

Italian Institute of Technology, Genoa, Italy

University of Rome Tor Vergata, Rome, Italy

University of Genoa, Genoa, Italy

Universitatea Politehnica București, Bucharest, Romania

State Optical Institute, St. Petersburg, Russia

AZ Corporation and Tomography Association, Moscow,
Russia

Tampere University of Technology, Tampere, Finland

University of Manchester, Manchester, UK

Imperial Cancer Research Fund, London, UK

University of Liverpool, Liverpool, UK

Royal Marsden Hospital, London, UK

University of Twente, Enschede, The Netherlands

Uniklinik RWTH Aachen University, Aachen, Germany

Alexandria University, Alexandria, Egypt	National Institute of Technology, Warangal, India
University Hospital, Kuala Lumpur, Malaysia	Jaypee University of Information Technology, Wagnaghat, India
Universiti Sains Malaysia (KCP), Tronoh, Malaysia	Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, India
Universiti Sains Malaysia, Penang, Malaysia	Tata Institute of Fundamental Research, Bombay, India
National University of Singapore, Singapore	Indian Institute of Technology, Bombay, India
King Mongkut's Institute of Technology, Bangkok, Thailand	Indian Institute of Technology, New Delhi, India
University of Hong Kong, Hong Kong	Indian Statistical Institute of Technology, Kolkata, India
Shanghai Jiao Tong University, Shanghai, China	College of Engineering, Pune, India
The Ninth People's Hospital, Shanghai, China	S.J. College of Engineering, Mysore, India
Northern Jiao Tong University, Beijing, China	P.E.S. College of Engineering, Mandya, India
Tsinghua University, Beijing, China	Adamas University, Kolkata, India
Beijing University of Posts and Telecommunications, Beijing, China	G.E. India Technology Centre, Bangalore, India
Xiamen University, Xiamen, Fujian, China	Philips Innovation Campus, Bangalore, India
Tokyo Institute of Technology, Tokyo, Japan	Siemens Information Systems Ltd., Bangalore, India
Nagoya Institute of Technology, Nagoya, Japan	M.S. Ramaiah School of Advanced Studies, Bangalore, India
Niigata University, Niigata, Japan	Post-Graduate Institute for Medical Education and Research, Chandigarh, India
Kyushu University, Fukuoka, Japan	Manipal Institute of Technology, Manipal, India
Gifu University, Gifu, Japan	Cleveland Clinic Foundation. Cleveland, OH, USA
Indian Institute of Science, Bangalore, India	Fischer Imaging, Denver, CO, USA
Indian Institute of Technology, Kharagpur, India	
Indian Institute of Technology, Roorkee, India	

L. Technology Transfer, Patents, and Consulting Activities

U.S. Patent 6,537, 233 on "Auditory display of knee joint vibration signals," awarded March 25, 2003. R.M. Rangayyan, S. Krishnan, G.D. Bell, and C.B. Frank. Assignee: University Technologies International Inc. (UTI #435.1).

AHFMR Technology Commercialization Grant, "Development of a non-invasive device for diagnosing knee-joint injury," \$34,925, 2000-2001. (With Mind to Market Solutions Inc., Calgary.)

Government of Alberta, Department of Technology, Research and Telecommunications; Grant received for the 1st stage of the project on "High resolution Digital Teleradiology" (Economic Analysis), with I.T.T. Export Corporation, Calgary (Dr. N.A. Goswami), \$20,000, 1988.

Served as consultant to several companies, corporations, and institutions.

M. Teaching and Curriculum Development

At the Tampere University of Technology, Tampere, Finland: Advanced Biomedical Image Analysis, 2011.

At the Ragnar Granit Institute of Biomedical Engineering, Helsinki, Finland, Biomedical Image Analysis, 2008.

At the Tampere University of Technology, Tampere, Finland: Biomedical Signal Analysis, 2000, 2007.

At the University of São Paulo, São Paulo, SP, Brazil: PEE830 Digital Image Processing, 1994.

At the University of Calgary: ENGG 213- Engineering Computation; ENGG 215- Engineering Practice, Design, and Communication; ENGG 233- Computing for Engineers I; ENGG 333- Computing for Engineers II; ENGG 303- Electrical Circuits and Machines; ENGG 323- Systems and Instrumentation; ENEL 327- Signals and Systems; ENEL 563- Biomedical Signal Analysis; ENEL 599- Electrical Engineering Project; ENEL 593- Digital Filters; ENEL 697- Digital Image Processing.

"Indian Classical Music," lecture-demonstrations on the flute, sitar, and tabla: Guest Lectures for GNST 359 Introduction to World Music; SAST 315 Understanding South Asia; MUED 671.06 Culture Studies and World Music (with U. Mazumdar).

At the Indian Institute of Science, Bangalore, India: ES9-202- Digital Signal Processing.

At the University of Manitoba: 24.208- Electric Circuits; 24.358- Signal Analysis III; 24.426- Communication Systems; 24.815- Digital Signal Processing; 24.822- Digital Image Processing;

Developed a new Fourth-year B.Sc. Electrical and Computer Engineering elective course ENEL 563 Biomedical Signal and Image Analysis, including a textbook, lecture notes, lab exercises, and problem-solution sets, 1997.

Developed the curriculum for a graduate program on Computer Vision for Universiti Sains Malaysia, Ipoh, 1994.

Developed the curriculum for a new course ENGG333 Advanced Engineering Computation, as member of a subcommittee, 1990.

Developed a graduate program curriculum in Biomedical Engineering at The University of Calgary, as Chairman of a subcommittee, 1985-89.

Developed a new set of computer program examples and lab assignments for ENGG 327/213 Engineering Computation, 1985.

Developed a new graduate course ENEL 697 "Digital Image Processing" at Electrical Engineering Department, University of Calgary, 1985. Laboratory facilities were also developed to support the course.

Developed procedures on the HP9816 computer for lab experiments on Fourier analysis, AM, and FM, for course 24.358, 1984 (with R. Lehner).

Formulated new graduate courses 24.830 "Computer Vision," 24.829 "Imaging in Biomedical Engineering" (with R. Gordon), and "Image Processing for Remote Sensing" (with Working Group for "Imaging and Remote Sensing"), at University of Manitoba, Department of Electrical Engineering, 1984.

Developed a new lab experiment on "Threshold effects in FM systems" for course 24.426 Communication Systems, 1983 (with R. Lehner).

Developed a new graduate course 24.822 "Digital Image Processing" at the University of Manitoba, Department of Electrical Engineering, 1983.

N. Student and Staff Supervision

N1. Graduate Theses Completed:

44. Ashis Kumar Dhara, (Ph.D., Cosupervisor, Indian Institute of Technology Kharagpur, India, 2015), "Development of a self-learning tool for radiologists using content-based image retrieval techniques."

43. Faraz Oloumi, (Ph.D., 2015), "Computer-aided Diagnosis of Plus Disease via Quantitative Analysis of

the Vascular Architecture in Retinal Fundus Images of Preterm Infants."

42. Paola Casti, (Ph.D., Cosupervisor, University of Rome Tor Vergata, Italy, 2015), "Computerized analysis of mammographic images for detection and characterization of breast cancer."

41. Jayasree Chakraborty, (Ph.D., Cosupervisor, Indian Institute of Technology Kharagpur, India, 2013), "Computer-aided detection of mammographic lesions: masses and architectural distortion."

40. Sansira Seminowich (M.Sc., 2012), "Digital Image Processing Techniques for Analysis of Images of Renal Biopsy Samples."

39. Paola Casti, (M.Sc., Cosupervisor, University of Rome Tor Vergata, Italy, 2011), "Development and validation of a computer-aided detection system for the identification of bilateral asymmetry in mammographic images."

38. Faraz Oloumi, (M.Sc., 2011), "Analysis of the Vascular Architecture in Fundus Images of the Retina."

37. Shantanu Banik (Ph.D., 2011), "Computer-aided Detection of Architectural Distortion in Prior Mammograms of Interval-cancer Cases."

36. Thanh Minh Cabral (Nguyen) (M.Sc., 2010), "Analysis of the Shape and Texture of Breast Masses in Mammograms."

35. Douglas Frey (M.Sc., Cosupervisor, 2009), "The derivation of the acoustical impulse response function of a music performance hall."

34. Xiaolu (Iris) Zhu (M.Sc., 2008), "Detection of the optic nerve head in images of the retina."

33. Yunfeng Wu (Ph.D., Beijing University of Posts and Telecommunications, Cosupervisor, 2008), "Novel Computational Intelligent Technologies and their Applications in Biomedical Signal Analysis."

32. Shantanu Banik (M.Sc., 2008) "Three-dimensional Image Processing Techniques to Perform Landmarking and Segmentation of Computed Tomographic Images."

31. Ilya Kamenetsky (M.Sc., 2008), "Digital Image Processing Techniques for Analysis of the Glomerular Basement Membrane."

30. Shormistha Prajna (M.Sc., 2007), "Detection of architectural distortion in prior mammograms using Gabor filters, phase portraits, fractal dimension, and texture analysis."

29. Fábio José Ayres (Ph.D., 2007), "Computer-aided Diagnosis of Architectural Distortion in Mammograms."

28. Randy Hoang Vu (M.Sc., 2006), "Strategies for three-dimensional segmentation of the primary tumor mass in computed tomographic images of neuroblastoma."

27. Yuhong (Kay) Liu (M.Sc., Cosupervisor, 2005), "Application of Efron's bootstrap methods to evaluate the performance of neural networks in the classification of mammographic features."

26. Xiaozheng (Eileen) Wang (M.Sc., Cosupervisor, 2004), "Application of data mining to mammographic data."

25. Hanford John Deglint (M.Sc., 2004), "Image processing algorithms for three-dimensional segmentation of the tumor mass in computed tomographic images of neuroblastoma."

24. Margaret Hilary Alto (Ph.D., 2003), "Indexed atlas of mammograms for computer-aided diagnosis of breast cancer."

23. Ricardo José Ferrari (Ph.D., Co-supervisor, University of São Paulo, São Carlos, SP, Brazil, 2002), "Computational detection of asymmetry between mammograms" (in Portuguese).

22. Naga Ravindra Mudigonda (Ph.D., 2001), "Image analysis methods the detection and classification of mammographic masses."

21. Sridhar Krishnan (Ph.D., 1999), "Adaptive signal processing techniques for analysis of knee joint vibroarthrographic signals."
20. Liang Shen (Ph.D., 1998), "Region-based adaptive image processing techniques for mammography."
19. Roseli de Deus Lopes (Ph.D.- University of Sao Paulo, Brazil, 1998), "Region-based techniques for processing three-dimensional images with applications in volume visualization."
18. Antonio Cesar Germano Martins (Ph.D.- University of Sao Paulo, Brazil, 1997), "Auditory display and sonification of images with texture."
17. Nema El-Faramawy (Ph.D.- Alexandria University, Egypt, 1996), "Measures of acutance and shape for classification of breast tumors."
16. Arup Das (M.Sc., 1996), "Region-based image processing."
15. Sridhar Krishnan (M.Sc., 1996), "Adaptive filtering, modeling, and classification of knee joint vibroarthrographic signals."
14. William Rolston (M.Sc., 1994), "Directional Image Analysis."
13. Yiping Shen (M.Sc., 1994), "Transmission Characteristics and Localization of Vibroarthrographic Signals."
12. Zahra Kazem-Moussavi (M.Sc., 1993), "Analysis of Knee Sound Signals via Least Squares Modeling."
11. Joseph Provine (M.Sc., 1992), "Peanoscanning for Image Compression."
10. Hieu N. Nguyen (M.Eng., 1992), "Object-based Contrast Enhancement."
9. Djamel Boulfefel (Ph.D., 1992), "Restoration of Nuclear Medicine Images."
8. Tamer F. Rabie (M.Sc., 1992), "Adaptive-Neighborhood and Iterative methods for Image Restoration."
7. Liang Shen (M.Sc., 1992), "Shape analysis of mammographic calcifications."
6. Gopinath R. Kuduvalli (Ph.D., 1992), "Image data compression for high-resolution digital teleradiology."
5. Sanjeev Tavathia (M.Sc., 1991), "Analysis of Knee Joint Vibration Signals by Linear Prediction."
4. William M. Morrow (M.Sc., 1990), "Region-based Image Processing Techniques with Application to Mammography."
3. Timothy C. Hon (M.Sc., 1988), "Restoration of Gamma Camera-Based Nuclear Medicine Images."
2. Subhasis Chaudhuri (M.Sc., 1987), "Digital Image Processing Techniques for Quantitative Analysis of Collagen Fibril Alignment in Ligaments."
1. Richard J. Lehner (M.Sc., 1985), "A three-channel microcomputer system for quantitative analysis of the phonocardiogram, electrocardiogram and carotid pulse signals."

N2. Undergraduate Theses/ Projects:

18. Chad Erven, "Implementation of a statistical analysis method for vibroarthrographic signals on an embedded TigerSHARC processor," 2007.
17. Foad Oloumi, Faraz Oloumi, and Peyman Eshghzadeh-Zanjani, "Detection and Analysis of Blood Vessels in the Retina," 2007.
16. Thanh Minh Nguyen, "Fractal analysis of mammographic masses," 2004.
15. Heather Bosnak, Ramanpreet Grewal, James Howland, and Ben Liu, "An indexed atlas of digital mammograms for computer-aided diagnosis of breast cancer," 2005.

14. Howard Lau, Kelvin Mok, Donald So, and Courtney Tse, "An indexed atlas of digital mammograms for computer-aided diagnosis of breast cancer," 2004.
13. Leslie Anderson, Jackalynn Sproat, Diane Janzen, Wai Ki Chau, "Computer workstation for analysis and classification of knee joint vibroarthrographic signals for non-invasive diagnosis of articular cartilage pathology," 1999 (with G.D. Bell).
12. Philip Arsenaault, Sharon Ellingsen, Shanif Lakhani, Paul Thomson, Mike Mulligan, Minesh Kuttlerwala, John Liu, "Computer workstation for analysis and classification of knee joint vibroarthrographic signals for non-invasive diagnosis of articular cartilage pathology," 1998 (with G.D. Bell).
11. Ram Reddy, "A study of the optimal threshold for the recursive least squares method of segmentation," 1994.
10. Salahuddin Elkadiki, "Objective characterization of image acutance," 1993.
9. Kenny Tse, "Quantitative wellbore fracture analysis from electrical images," 1992.
8. Terry Baydock, "Image coding and compression for digital teleradiology," 1984 (with R. Gordon and J. Dunning).
7. Patricia Palanuk, "Homomorphic deconvolution of EMG signals," 1984.
6. A. Wong, "Microcomputer system for arrhythmia monitoring," 1984.
5. H.K. Wong, "Microcomputer system for adaptive neighborhood image processing," 1984 (with R. Gordon and J. Dunning).
4. Brent Kizuik, "Automated control of a rotating microscope system," 1983 (with R. Gordon).
3. Kirby Jaman, "Optimal display of limited-view computed tomograms in 3D," 1983 (with R. Gordon).
2. Richard Lehner, "Microprocessor-based heart sound analyzer," 1983.
1. Curtis Quinn, "Video simulation of steerable x-ray microbeam imaging," 1983 (with R. Gordon).

N3. Supervision of Other Research Staff:

43. Lucas Frighetto Pereira, 2016, FAPESP scholar, from University of São Paulo, Ribeirão Preto, SP, Brazil. Classification of benign and malignant vertebral compression fractures in MR images.
42. Eliana Silva de Almeida, 2015, CNPq Science Without Borders Postdoctoral Fellow, from Federal University of Alagoas, Maceio, Brazil.
41. Ivan Cruz Aceves, 2013, Visiting PhD student, División de Ingenierías, Campus Irapuato-Salamanca, Universidad de Guanajuato, Mexico.
40. Shantanu Banik, 2012, NSERC CREATE postdoctoral fellow, "Computer-aided Detection of Architectural Distortion in Prior Mammograms of Interval-cancer Cases."
39. Denise Guliato, Post-doctoral Fellow from the Federal University of Uberlândia, Brazil, 2007, "Computer-aided diagnosis of breast cancer."
38. Begoña Acha Piñero, Visiting Researcher from the University of Seville, Spain, 2004, "Detection of calcifications in mammograms."
37. María del Carmen Serrano Gotarredona, Visiting Researcher from the University of Seville, Spain, 2004, "Detection of calcifications in mammograms."
36. Randy Hoang Vu, "Medical image analysis," NSERC USRA, 2004.
35. Túlio César Soares dos Santos André, from Universidade de São Paulo, Ribeirão Preto, SP, Brazil, "Neural networks for the detection of breast cancer," 2003.

34. Antonio Cesar Germano Martins, from the Faculty of Engineering, Sorocaba, São Paulo, SP, Brazil, 2001, "Analysis of texture in images."
33. Fábio José Ayres, from the University of São Paulo and Faculdade SENAC de Ciências Exatas e Tecnologia, (SENAC College of Computational Sciences and Technology), São Paulo, SP, Brasil, "Segmentation and estimation of the histological composition of the tumor mass in computed tomographic images of neuroblastoma," 2001, 2002.
32. Sílvia Delgado Olabarriaga, from the Federal University of Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil, 2000, "Subjective and objective analysis of image sharpness."
31. Jérôme Jouffroy, Internship Student from Université de Savoie, Annecy, France, 1999, "Analysis of asymmetry in mammographic images."
30. Hilary Alto, 1998, Part-time Research Associate, "Computer-aided Diagnosis of Breast Cancer" (with J.E.L. Desautels).
29. Begoña Acha Piñero, Visiting Researcher from the University of Seville, Spain, 1998, "Medical Image Processing."
28. María del Carmen Serrano Gotarredona, Visiting Researcher from the University of Seville, Spain, 1998, "Medical Image Processing."
27. Denise Guliato, Visiting Researcher from the Federal University of Uberlandia, Brazil, 1998, "Segmentation of breast tumor regions in mammographic images."
26. Mihai Ciuc, Visiting Research Associate from University of Bucharest, Romania, 1997, "Adaptive neighborhood filtering of color images."
25. Marcelo Knörich Zuffo, Visiting Research Associate from Universidade de São Paulo, São Paulo, SP, Brasil, 1997, "Iconographic display of mammographic features for computer-aided diagnosis of breast cancer."
24. Olivier Menut, Internship Student from Institut National Polytechnique de Grenoble, France, 1997, "Detection, shape analysis, and classification of breast tumors in mammographic images," (with J.E.L. Desautels).
23. Yiping Shen, Research Assistant, 1995, "Clinical evaluation of computer-aided enhancement and analysis of mammograms for the diagnosis of early breast cancer," (with J.E.L. Desautels).
22. Umi Kalthum Ngah, Visiting Research Associate, Universiti Sains Malaysia, Tronoh, Malaysia, "Digital Image Processing with applications to Mammography," 1993.
21. Salahuddin Elkadiki, "Image Acutance," 1993.
20. Yiping Shen, Research Assistant, "Analysis of ligament vascularity," 1991 (with Dr. R.C. Bray).
19. William Rolston, Research Assistant, "Directional Image Processing," 1991.
18. Sanjeev Tavathia, Research Assistant, "Heart sound signal analysis," 1991.
17. Kevin Eng, Summer Research Assistant, "Digital image processing techniques for the analysis of vascularization of ligaments in response to injury," 1990 (with Dr. R.C. Bray).
16. Dr. Raman Paranjape, Post-doctoral Research Associate, "Digital Image Processing Techniques for the Analysis of Mammograms," 1992 (with Dr. J.E.L. Desautels).
15. Theo Smit, Research Associate, "Digital Signal Processing Techniques for Non-invasive Detection and Classification of Cartilage Pathology in the Knee," 1989 (with Dr. C. Frank and Dr. G.D. Bell).
14. Dr. Yuaning Zhang, Post-doctoral Research Associate, "Digital Signal Processing Techniques for Non-invasive Detection and Classification of Cartilage Pathology in the Knee," 1994 (with Dr. C. Frank and Dr. G.D. Bell).

13. Dr. Zhi-Qiang Liu, Post-Doctoral fellow (CDC PACER Fellow and AHFMR Fellow), "Quantitative analysis of collagen alignment in ligaments for optimization of healing," 1990 (with Dr. C. Frank)
12. Richard Smith, "Knee joint sound signal analysis," 1987 (with C. Frank and D. Bell).
11. Richard Smith, "Biomedical Signal Analysis - Electrodiagnosis and Acoustodiagnosis," 1986, (with C. Frank and D. Bell).
10. D. Mitchell, 1986, "Reconstruction and restoration of seismic tomography in bore holes."
9. Hieu Nguyen, "Adaptive Neighbourhood Image Processing Applied to Mammograms," 1985, 1986.
8. Hieu Nguyen, Duane Webb, "Digital Processing of Electron Micrographs of Rabbit Ligament Collagen Fibers," 1985 (with C. Frank).
7. Mike Bauer, Ed Block, "Phonocardiogram Signal Processing," 1985.
6. Doug Den Hoed, Bill Royan, "Digital Image Processing using Adaptive Neighbourhoods," 1985.
5. Tim Strecker, Part-time Research Engineer, "Digital Image Processing," 1985.
4. R.J. Lehner (with R. Gordon), 1984 "Digital subtraction angiography using adaptive neighborhood image processing."
3. M.L. Miller, 1984, "Identifying and locating heart sound sources in 3D: A preliminary study."
2. Greg Kozier, Part-time Research Associate, "Evaluation of the SPARTAF algorithm on the EMI CT scanner," 1983 (with R. Gordon).
1. Paul Soble, Part-time Research Associate, "Homomorphic deconvolution of geometric artifacts in limited-view computed tomography," 1984 (with R. Gordon).

O. External Administrative and Organizational Service (Selected Items)

- Program Committee, International Congress on Computer Assisted Radiology and Surgery, 2008-2016.
- Journal Advisory Board, International Journal of BioSciences and Technology, 2008 - 2009.
- Co-Chair and Co-Editor of proceedings, IASTED International Conference on Telehealth, Banff, Alberta, Canada. 19 – 21 July 2005.
- External Examiner, Chinese University of Hong Kong, Electronics Engineering, 2003 – 2006.
- Associate Editor: IEEE Transactions on Biomedical Engineering, 1989-96.
- Program Co-Chair, 20th Annual International Conference of the IEEE EMBS, Hong Kong, October 1998.
- Track Chair for Imaging, 18th Annual International Conference of the IEEE EMBS, Amsterdam, The Netherlands, October 1996.
- Organized and Chaired a session on "Biomedical Engineering Education: An International Perspective," ASEE Conference, Edmonton, 26-29 July 1994 (with Z. Koles).
- Member, IEEE EMBS Conference Committee, 1992-99.
- Member, Scientific Program Committee and Editorial Board, International Symposium on Computerized Tomography, Novosibirsk, Russia, 10-14 August, 1993.
- Program Chair and Co-Editor, 15th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, October 28-31, 1993, San Diego, CA.
- Chairman (founding), IEEE EMBS Southern Alberta (Calgary) Chapter, 1991-93.

Canadian Regional Representative to the Administrative Committee (AdCom) of the Engineering in Medicine and Biology Society of the IEEE, 1990-93.

Member, Canadian Standards Association- Committee on Programming Languages- Fortran Working Group (on the development of the new standard Fortran90), 1989-94.

Program Chairman, Organizing Committee for the IEEE Western Canada Exhibition and Conference on "Telecommunication for Health Care: Telemetry, Teleradiology, and Telemedicine," July 6-7, 1990, University of Calgary, 1988-90.

Chairman, Local Arrangements Committee, Optical Society of America Topical Meeting on "Industrial Applications of Computed Tomography," Hecla Island, Manitoba, August 1984.

P. University Administrative and Organizational Service (Selected Items)

Associate Vice-President (Research), 2000-2002.

Associate Head (Undergraduate Studies), Department of Electrical and Computer Engineering, University of Calgary, 1993-94.

Acting Head, Department of Electrical and Computer Engineering, University of Calgary, 1991-92.

Chair, Faculty of Engineering Infomatics Committee, 1996-97.

Chair, Faculty Advisory Committee on Computing, 1986-87, Member 87-88.

Chair, Committee for Graduate Studies Curriculum in Biomedical Engineering, Faculty of Engineering, University of Calgary, 1985-90.

IEEE Student Branch Counselor, University of Calgary, 1985-90.

Q. Community Service (Selected Items)

Music Teacher, School of Indian Languages and Performing Arts, Calgary, 2009-2011, 2013-...

President, Raga Mala Music Society of Calgary, 1991-93, Treasurer 1989-91.

Judge, 1988 Science Fair, St. Stephen's School and Father Whelihan School.

President, Southern India Cultural Association, Calgary, 1985, (1986).

Volunteer Tutor, Kendriya Vidyalaya (Central School), Indian Institute of Science, Bangalore, 1979-80.

R. Visiting, Honorary, or Adjunct Professorships

Amity University, Noida, India, 2016.

State University of São Paulo (Universidade Estadual Paulista, UNESP), Sorocaba, Brazil, 2012.

Department of Electronic Engineering, University of Rome Tor Vergata, Rome, Italy, June 2012.

Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur, India, November 2010 – January 2011.

Kyushu University, Fukuoka, Japan, October 2011.

Xiamen University, Xiamen, Fujian, China, 2010 – 2013.

University of Liverpool, Liverpool, UK, 2007 – 2013.

Beijing University of Posts and Telecommunications, Beijing, China, 2006 – 2009.

Manipal Institute of Technology, Manipal, Karnataka, India, 2006 – 2009.

Tampere University of Technology, Tampere, Finland, April 1999, April 2000.

Lerner Research Institute, Cleveland Clinic Foundation, Cleveland, OH, December 1999.

Universitatea Politehnica din București, Bucharest, Romania, April 1996, 1997, 1998.

Escola Politécnica, Universidade de São Paulo, São Paulo, SP, Brasil, 1994-...

Department of Electrical Engineering, Indian Institute of Science, Bangalore, India, August 1994, July-December 1988.

Département Image et Traitement de l'Information, Télécom Bretagne- École Nationale Supérieure des Télécommunications de Bretagne, Brest, France, May-June 1995, July 1999.

S. International Research Collaboration and Developmental Activities

I have given many lectures, research seminars, and tutorials on digital image processing, computer vision, medical imaging and image analysis, biomedical signal analysis, and related topics, as well as collaborated with researchers at universities, institutes, and research organizations in India, Canada, U.S.A., Brazil, Argentina, Uruguay, Chile, Zimbabwe, U.K., Russia, The Netherlands, Egypt, France, Germany, Spain, Italy, Croatia, Romania, Finland, Malaysia, Thailand, Japan, Hong Kong, Singapore, and China.

Computer programs and datasets we have developed for medical image analysis and other applications have been used or are being used by research groups in Canada, the U.S.A., the U.K., India, China, Brazil, Argentina, France, Italy, Spain, Romania, and Malaysia.

T. News Media Coverage – Articles and Interviews

Live performance and interview with John Reid on CJSW radio, Calgary, 26 April 2017, Classical Music of India on the bamboo flute bansuri, with Utpal Mazumdar on the tabla, air time for CD "Eons to Eternity."

Live performance and interview with Helen Young on CJSW radio, Calgary, 28 September 2016, Classical Music of India on the bamboo flute bansuri, with Utpal Mazumdar on the tabla, "Twilight Concert Series."

Live performance and interview on Sursangam radio, Calgary, 14 July 2015, Classical Music of India on the bamboo flute bansuri with Harjeet Singh on the tabla.

Live performance and interview with John Reid on CJSW radio, Calgary, 7 July 2015, Classical Music of India on the bamboo flute bansuri, with Utpal Mazumdar on the tabla, air time for CD "Mystical Melodies."

EE Web, Electrical Engineering Community, "Featured Engineer," <http://www.eeweb.com/spotlight/interview-with-rangaraj-m.-rangayyan>, 21 April 2014.

"Researchers working toward early cancer detection," by Erica Howes, The Charlatan, Carleton, ON, Canada, April 09 2014. <http://www.charlatan.ca/2014/04/researchers-working-toward-early-cancer-detection/#>

"Digital imaging could help University of Calgary software detect cancer even earlier," metro, Calgary, 1 April 2014. By Robson Fletcher.

"New Schulich software helps spot breast cancer earlier," UToday, March 19, 2014.

"Raj Rangayyan: Master of Many Crafts," interview article by Sara Tehranian, pp10-13, Schulich Engineer, Spring 2013.

"Professional Engineers help make medical breakthroughs," p14, National Engineering and Geoscience Month, Special Advertising Feature, APEGA, 2013-02-28, Calgary Herald and several Canadian newspapers.

"O computador e a flauta," interview article by Cíntia Leone, UNESP journal (in Portuguese), on "The computer and the flute:

Professor of University of Calgary discusses both the use of digital images in medicine and the characteristics of Indian music," November 2012.

"New steps forward in cancer research," Schulich Engineer, Spring 2012, p34.

Interview on computer-aided diagnosis of breast cancer on the CTV Alberta Prime Time Show with Jennifer Martin, 2012-04-02.

Interview on computer-aided diagnosis of breast cancer on the CTV national Health Segment Show with Marcia MacMillan, 2012-04-02.

Interview on computer-aided diagnosis of breast cancer with Dave Rutherford on QR77 radio, 2012-04-02.

Interviews on computer-aided diagnosis of breast cancer broadcast on CTV, CBC TV, and Global TV, 2012-03-30

"University of Calgary software detects cancer before tumour forms," Amanda Stephenson, Postmedia NewsMarch, 2012-03-30. This article was carried by several newspapers across Canada, including the Edmonton Journal, Vancouver Sun, and Montreal Gazette.

"Program advances breast-cancer detection," Amanda Stephenson, Calgary Herald, 2012-03-30.

"New breast cancer screen could find other cancers," Michael Wood, Calgary Sun, 2012-03-30.

"Engineers at the University of Calgary have won a Publication Prize...." Interview with Jennifer Keene, CBC Radio, Calgary Eyeopener, 2012-03-29.

"Computer technology key to early detection of breast cancer," by Jennifer Sowa, UToday, University of Calgary, 2012-03-29.

Interview with Arun Dev, DNA, Bangalore, India, on computer-aided diagnosis, published 3 January 2011.

"Soothing Sounds." Interview with Gil Tucker, Global TV, on my CD "Totally Peaceful" and the classical music of India. 11 January 2010.

"Totally Peaceful." Live interview with John Reid, Canadian Music Centre, Prairie Region, on CJSW Radio, on my CD and the classical music of India. 5 January 2010.

"University professor the first in Canada to receive acknowledgement from major international society," by Laurie Wang, Newsletter of the Faculty of Medicine, University of Calgary, July 24, 2007.

"Um software amigo do peito," interview article by Arlete Mattos, with Dr. Paulo Mazzoncini de Azevedo Marques, published in USP-Ribeirão, newspaper of the University of São Paulo, Ribeirão Preto, 13 March 2006. The same matter was also published on the website of the Clinical Hospital of the University of São Paulo, Ribeirão Preto.

"Programa de computador no combate ao câncer de mama," interview article by Angelo Davanço, with Dr. Paulo Mazzoncini de Azevedo Marques, published in Jornal a Cidade Ribeirão Preto, SP, Brazil, 9 March 2006.

TV Clube (Bandeirantes) interview by Roberto Ribeiro, 10 Feb. 2006, on computer-aided diagnosis of breast cancer, with Dr. Paulo Mazzoncini de Azevedo Marques, Ribeirão Preto, SP, Brazil.

RP9 TV interview by Angela Pepe, 9 Feb. 2006, on computer-aided diagnosis of breast cancer, with Dr. Paulo Mazzoncini de Azevedo Marques, Ribeirão Preto, SP, Brazil.

"A Second Opinion," interview article by Malwina Gudowska, Avenue magazine, November 2005, pp 26 – 28.

"Group Creates an Information Autobahn," part of Feature Article by Nordahl Flakstad, in The PEGG: Newsletter of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta, 32(2):18, February 2004.

"U of C Salutes its Stars," On Campus, University of Calgary, 14 November 2003.

"SPIE's in the Faculty?," Enginuity, Faculty of Engineering, University of Calgary, Fall 2003.

“Engineering prof named SPIE Fellow," On Campus, University of Calgary, 3 October 2003.

“Listen, Honey...." Interview on CBC Radio on my CD and the classical music of India. April 2003. (With Utpal Mazumdar.)

“Listen, Honey...." Live interview and performance on CJSW Radio on my CD and the classical music of India. April 2003. (With Utpal Mazumdar.)

“If you have the time...." Interview with CBC Radio on my CD and the classical music of India. November 2000. (With Utpal Mazumdar.)

“Engineering better breast cancer screening," CBC Radio interview with Jeff Collins, June 2000.

“The Music of North India." Cranbrook Daily Townsman. 22 September 1999. Cover-page photo and caption on concert sponsored by the College of the Rockies, Cranbrook, BC.

“Engineer Enhances Cancer Screening," Robert Walker, Interview article, Calgary Herald, 24 April 1999.

“Better Breast Cancer Screening," Interview article, Alberta Heritage Foundation for Medical Research (AHFMR) Newsletter, March/April 1999, p7.

“Computer-aided diagnosis of breast cancer." Major media event was organized on 23 April 1999 by the Alberta Foundation for Medical Research (AHFMR): about 10 news, radio, and TV reporters visited our laboratory. According to Rhonda Lothammer of the AHFMR, the interview was broadcast or published by the A Channel, Calgary Herald, Calgary Sun, CFCN, CICT, QR77, Shaw TV, CBC News, CHQR, CHQT, and CISN (Edmonton).

“Computer-aided diagnosis of breast cancer." Live interview via telephone for QR77 Radio, 23 April 1999.

“Engineering computers to diagnose breast cancer earlier." Featured in “Selected Alberta Science and Research Success Stories: Volume III," published by ASRA: Alberta Science and Research Authority, September 1999, p29.

“Increasing precision in mammograms," Progressions... AHFMR Funded Cancer Research. Alberta Heritage Foundation for Medical Research Triennial Report. 1999, p22.

“Seeing Mammograms More Clearly." Arch, 1999 Summer, p7.

“In Tune With You." Interview with CBC Radio on the classical music of India and my CD, 25 November 1998. (With Utpal Mazumdar.)

“Computer-aided diagnosis of breast cancer," Presentation at the opening ceremony and media event of the Multimedia Advanced Computational Infrastructure (MACI) facility at the Rozsa Centre, University of Calgary, 28 September 1998.

“Computer-aided diagnosis of breast cancer," Interview with the television station “A Channel," 28 September 1998.

“Classical music of India," Interview and live performance on the flute, CJSW Radio, 15 March 1998. (With Utpal Mazumdar.)

“Just In Time ...just for you!" Interview with CBC Radio on the classical music of India and my CD, 10 February 1998. (With Utpal Mazumdar.)

Classical music of India and the bamboo flute, TV news-hour interview with Renata Canales (in Portuguese), EPTV Ribeirão Preto, São Paulo, Brazil, July 1998.

“Computer-aided diagnosis of breast cancer," Interview with CBC Radio (live broadcast), 24 March 1998.

“Engineering Tools for Breast Cancer Screening," *Engenuity*: Newsletter of the Faculty of Engineering and the Engineering Associates Program, University of Calgary, Spring 1998, p1,3.

“Prof engineers better tools for breast cancer screening," University of Calgary Gazette, Interview article, 23 March 1998, p1,2.

“Os incríveis sons que vêm da Índia” (The incredible sounds that come from India – in Portuguese), Gustavo Guimarães, Interview article, *Jornal da Universidade de São Paulo*, São Paulo, Brazil, 3-9 April 1995, p12.

“Computers Lend Healing Hand,” Sharon Pearce, Interview article, *The PEGG: Newsletter of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta*, October 1993.

“A twist of fate: Researchers at University of Calgary train electron microscopes and a supercomputer on the problem of ligament injuries,” J. Thornton (interviewing R.M. Rangayyan and C.B. Frank), *Logic: Control Data Corporation*, 1987 Autumn Issue, pp. 8-13.