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Ottawa Section
IEEE 125th EMBS Seminar Series
Distinguished Lecture

Computer-Aided Diagnosis of Breast Cancer: Towards the Detection of Early and Subtle Signs

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Mammograms are difficult images to interpret, especially in the screening context. Objective methods for the analysis of mammographic features facilitate the development of computer-aided procedures to assist radiologists in the evaluation of ambiguous cases. Quantitative representation of signs of breast cancer in mammograms for computer-aided diagnosis requires the design of descriptors to represent diagnostic features. This seminar will present an overview of several digital image processing techniques that we have developed over the past 20 years for the following applications:

- Contrast enhancement
- Analysis of calcifications
- Shape analysis of tumors
- Texture analysis of tumors
- Detection of calcifications
- Detection of masses and tumors
- Texture flow-field analysis of masses
- Analysis of bilateral asymmetry
- Detection of architectural distortion
- Detection of the skin-air boundary, pectoral muscle, and the fibro-glandular disc
- Content-based image retrieval, pattern classification, and computer-aided diagnosis.

The seminar will present general descriptions and examples of the techniques listed above. Our latest work on the application of Gabor filters, phase portraits, and oriented texture analysis for the detection of architectural distortion will be described in detail.

Nov 12, 2009
admission is free
17:30 – 19:30 pm
SITE 5084
University of Ottawa

Light refreshment will be served

Rangaraj M. Rangayyan is a Professor with the Department of Electrical and Computer Engineering, and an Adjunct Professor of Surgery and Radiology, at the University of Calgary, Calgary, Alberta, Canada. He received the Bachelor of Engineering degree in Electronics and Communication in 1976 from the University of Mysore at the People's Education Society College of Engineering, Mandya, Karnataka, India, and the Ph.D. degree in Electrical Engineering from the Indian Institute of Science, Bangalore, Karnataka, India, in 1980. His research interests are in the areas of digital signal and image processing, biomedical signal analysis, biomedical image analysis, and computer-aided diagnosis. He has published more than 130 papers in journals and 210 papers in proceedings of conferences. His research productivity was recognized with the 1997 and 2001 Research Excellence Awards of the Department of Electrical and Computer Engineering, the 1997 Research Award of the Faculty of Engineering, and by appointment as a "University Professor" in 2003, at the University of Calgary. He is the author of two books: Biomedical Signal Analysis (IEEE/ Wiley, 2002) and Biomedical Image Analysis (CRC, 2005); he has coauthored and coedited several other books. He was recognized by the IEEE with the award of the Third Millennium Medal in 2000, and was elected as a Fellow of the IEEE in 2001, Fellow of the Engineering Institute of Canada in 2002, Fellow of the American Institute for Medical and Biological Engineering in 2003, Fellow of SPIE: the International Society for Optical Engineering in 2003, Fellow of the Society for Imaging Informatics in Medicine in 2007, Fellow of the Canadian Medical and Biological Engineering Society in 2007, and Fellow of the Canadian Academy of Engineering in 2009. He has been awarded the Killam Resident Fellowship thrice (1998, 2002, and 2007) in support of his book-writing projects.

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