

# Jordan University of Science and Technology

## Progressive lossy to lossless compression of ROI in mammograms: Effects on microcalcification detection

**Authors:** Imad Zyout, Ikhlas Abdel-Qader and Hazem Al-Otum

**Abstract:** Progressive lossy to lossless image compression of region-of-interest (ROI) in digital mammograms ensures receiving data of high quality at early stages of the transmission process which can be very useful for handling mammograms in Picture Archiving and Communication Systems (PACS) and teleradiology systems. In this paper, ROI images corresponding to clustered microcalcification in digitized mammogram are compressed using wavelet based progressive lossy to lossless image compression scheme. The coding scheme is optimized by a proper selection of the combination of reversible wavelet transform filters and starting bitplane level. The proposed algorithm is implemented and tested using several mammograms from the Mammographic Image Analysis Society (MIAS) database. The experimental results show that ROI- based image compression offers a high visual quality of compressed images at a very low bit rate (0.05 bpp), and the combination of the 2/6 integer wavelet transform and the starting of ROI coding at moderate bitplanes represents an optimal selection. For example, high compression (0.05 bpp) using the 2/6 transform with ROI coding starting at moderate bitplane produced compression results with a lower mean-square-error (MSE) than those obtained from the same transform with ROI coding starting at lower and higher bitplanes. Also, the visual quality of its compression results was better than those of the other transforms.