

LIST OF FIGURES

FIGURE NO	TITLE	PAGE NO.
1.1	B-Mode US imaging system	2
1.2	US Echocardiographic image	4
1.3 (a)	US image scanned from a cylinder phantom	5
1.3 (b)	Phantom picture captured by a digital camera	5
1.4	One level decomposition of UDWT	10
1.5	One level reconstruction of UDWT	10
1.6	Inter-scale dependencies of the adjacent subband coefficients	11
1.7 (a)	Original signal	15
1.7 (b)	Hard thresholded signal	15
1.7 (c)	Soft thresholded signal	15
3.1	Block diagram of wavelet based denoising	34
3.2	A square region R (9x9) and its sub regions (3x3) in a subband	39
3.3	Histogram pdf of HH^1 subband	42
3.4	Comparison of pdfs' generated with ML and homogeneity measure based variances for HH^1 subband	42
3.5	Comparison of thresholding functions	45
3.6	Clinical US image 1	47
3.7	Clinical US image 2	47
3.8	Clinical US image 3	47
3.9	Visual quality comparison of EAWF with various filters for synthetic phantom image	48

3.10	Comparison of visual quality of EAWF for US image1 for different noise variances	51
3.11	Graphical analysis of various performance measures of EAWF for US image 2	52
3.12	Comparison of visual quality of EAWF with existing filters for US image3	54
4.1	Block diagram of SIIAWF ¹	57
4.2	Histogram pdf of HH ¹ subband	60
4.3	Comparison of pdfs' generated with ML estimate, homogeneity measure and intra-scale measure based variances	61
4.4	Comparison of thresholding function of SIIAWF ¹ with soft thresholding and Qin et al approaches	63
4.5	Comparison of visual quality of SIIAWF ¹ with existing filters for synthetic phantom image	65
4.6	Comparison of visual quality of SIIAWF ¹ for different noise variances for US image 1	69
4.7	Graphical analysis of various performance measures of SIIAWF ¹ for US image2	70
4.8	PSNR comparison of SIIAWF ¹ for various window sizes and noise variances	71
4.9	Comparison of visual quality of SIIAWF ¹ for US image3	71
4.10	Block diagram of SIIAWF ²	73
4.11	Histogram pdf of HH ¹ subband	75
4.12	Comparison of pdfs' generated with ML, homogeneity, intra-scale and combined inter and intra-scale measure based variances	76

4.13	Calculation of change in error	78
4.14	Comparison of visual quality of SIIAWF ² with various filters for synthetic phantom image	82
4.15	Comparison of visual quality of SIIAWF ² for different noise variances for US image1	85
4.16	Graphical analysis of various performance measures of SIIAWF ² for US image2	86
4.17	Comparison of PSNR and EPI between the two stages of SIIAWF ²	87
4.18	Comparison of visual quality of SIIAWF ² with existing filters for US Image3	87
5.1	Histogram of original coefficients (a-c), noisy coefficients(d-f) and soft thresholded coefficients (g-i)	91
5.2	Block Diagram of ISTWF	92
5.3	Comparison of thresholding function of ISTWF with soft thresholding and Andria et al approaches	96
5.4	Original and reconstructed coefficients using Bayes and inter-scale threshold values	97
5.5	Comparison of Bayes and inter-scale threshold values	97
5.6	Comparison of visual quality of ISTWF with existing filters for synthetic phantom image	99
5.7	Comparison of visual quality of ISTWF for different noise variances for US image1	102
5.8	Graphical analysis of various performance measures of ISTWF for US image2	103

5.9	Comparison of visual quality of ISTWF with existing filters for US image3	104
6.1	Block diagram of the proposed inter and intra-scale activity based fusion approach	110
6.2	Comparison of visual quality of FBWF with existing filters for synthetic phantom image	116
6.3	Comparison of visual quality of FBWF for various noise variances for US image1	122
6.4	Graphical analysis of various performance measures of FBWF with proposed filters for US image2	123
6.5	Visual quality comparison of FBWF with existing filters for US image3	124