LIST OF FIGURES

Figure 1.1 Various Steps in Weld Defect Detection................................. 4
Figure 1.2 Architecture of Back Propagation Network (BPN) ............ 12
Figure 4.1 Represents 4 -points in xy plane................................. 58
Figure 4.2 Represents the corresponding sinusoidal curves in the
parametric plane......................................................... 58
Figure 4.3 The Radiographic Weld Image of Lack of Penetration with
Salt and Pepper noise of noise density 0.2 ......................... 63
Figure 4.4 Denoised Radiographic Weld Image with Lack of Penetration
defect.................................................................................. 64
Figure 4.5 Weld image of Slag Inclusion defect contaminated by noise 64
Figure 4.6 Denoised weld image with Slag Inclusion defect............ 65
Figure 4.7 Canny edge detected weld image of Lack of Penetration
applied on a pre-processed image................................. 65
Figure 4.8 The Hough peaks obtained by using Hough Transform...... 66
Figure 4.9 The Hough peaks detection using triangularly traversed
Hough Transform....................................................... 66
Figure 4.10 The segmented weld image using the triangularly
traversed Hough Transform.............................................. 67
Figure 4.11 The Radiographic Weld Image of Porosity....................... 67
Figure 4.12 Segmented Weld Image of Porosity using Watershed
method................................................................. 68

Figure 4.13 The Radiographic Weld Image of Lack of Fusion weld Defect ................................................................. 68

Figure 4.14 The segmented weld image of Lack of Fusion using Hough Transform................................................................. 68

Figure 4.15 Weld Image of Oxide Inclusion defect................................. 69

Figure 4.16 Segmented Weld Image of Oxide Inclusion using Watershed method................................................................. 69

Figure 4.17 Number of Swaps Vs Noise density for 75x75 image ........ 70

Figure 4.18 Number of Swaps Vs Noise density for 100x67 image....... 70

Figure 4.19 Number of Swaps Vs Noise density for 221x166 image..... 71

Figure 4.20 Number of Swaps Vs Noise density for 320x240 image.... 71

Figure 5.1 Radiographic weld noisy image containing Burn Through and its corresponding denoised image. ......................... 84

Figure 5.2 Radiographic weld image containing Burn Through and its corresponding gamma corrected Image ......................... 85

Figure 5.3 Radiographic weld image containing Burn Through and its corresponding Watershed segmented Image .................. 85

Figure 6.1 Weld Radiographic image of Slag Inclusion...................... 97

Figure 6.2 Histogram of low contrast image shown in Figure 6.1 ...... 97

Figure 6.3 Histogram equalized image of image shown in Figure 6.1... 98

Figure 6.4 Histogram of high contrast image (Histogram equalized
image) shown in figure 6.3 ........................................... 98

Figure 6.5 Resultant Segmented image using Region growing......... 99

Figure 6.6 Result of K- Means Clustering........................................ 99

Figure 7.1 Architecture of LVQ Neural Network ......................... 106

Figure 7.2 Image of Lack of Penetration Welding Defect and its
 corresponding Watershed segmented image...................... 109

Figure 8.1 Input Head Phantom and Lack of Penetration Phantom
 Images................................................................. 115

Figure 8.2 Reconstructed Images of Head Phantom image for 3,16,32 and
 45 projections using SART Algorithm................................. 116

Figure 8.3 Reconstructed Images of Lack of Penetration Phantom image for
 3,16,32 and 45 projections using SART Algorithm.............. 117

Figure 9.1 Diagrammatic representation of Radon Transform.......... 125

Figure 9.2 Weld image with Lack of Penetration defect contaminated by
  Guassian noise.......................................................... 133

Figure 9.3 Denoised Weld image with Lack of Penetration defect
  using adaptive filter .................................................. 133

Figure 9.4 Input image and Watershed segmented weld image of
  Lack of Penetration ...................................................... 134

Figure 9.5 Input image and Watershed segmented weld image of
  Burn Through .......................................................... 134