CHAPTER 10: CONCLUSION AND FUTURE WORK

Non Destructive Testing (NDT) is a technique for damage assessment, disaster prediction and quality control, to detect the defects without affecting the internal structure. This thesis presents and proposes some novel techniques for weld flaw classification from industrial radiography for improving the safety of nuclear power plant, petrochemical industries etc using image processing and clustering techniques. Six different novel approaches are conducted and documented in this thesis for the classification of the weld defect along with a broad literature survey of various techniques conducted by numerous researchers in this field. Weld defect classification in radiographic images using Fuzzy C-Means clustering and Zernike moments, PCA and K-Means clustering based weld defect identification from radiographic images, Weld defect recognition in radiography based on Projection Profile and RST invariant by using LVQ, Detection using Image reconstruction by Simultaneous Algebraic Reconstruction Technique (SART), An efficient fast processing Adaptive Median filter based on enhanced Dijkstra’s 3-way partitioning is developed in this thesis, Weld flaw identification from radiographic weld images using Radon Transform and improved Fuzzy C-Means clustering. This thesis presents novel approaches for the improvement of automatic
classification and judgement of discontinuities or defects in welding. The result shows that these above techniques are robust and provide a good detection rate for different types of weld flaws. The future scope of this research work lies in the field of pre-processing, segmentation and feature extraction. The segmentation and feature extraction techniques like Watershed, Hough Transform and Zernike Moments respectively are mathematically and computationally complex due to the morphological operations, parametric plane conversions and orthogonal projections respectively, thereby consuming more execution time. So there is always a future scope for making the image enhancement, segmentation and feature extraction techniques simpler and more effective by reducing computational complexity which will help in faster and more accurate recognition of weld defects from radiographic images.