CHAPTER 8

CONCLUSIONS AND SCOPE FOR FUTURE STUDY

8.1 Conclusions

The main aim of this research work is to design and implement an efficient oil spill detection and classification method for SAR images. There are lot of problems can be identified from SAR images about ocean surface. SAR sensors and SAR images are used to monitor about the pollution and it can be demonstrated at basin scale. SAR is one of the most important applicable sensor device where it detects the oil spills at different whether, night and day. This study aimed to use different oil spill detection and classification methods on SAR images. The images are available and taken from the scientific community. Most of the existing methods are semi-automatic and are helpful only in certain circumstances and they have lot of manual process. In order to make it fully automatic this research work motivated to design and develops a fully automatic approach for oil spill detection and classification on SAR images.

In order to carry out the research work, it has been broadly classified into three different stages of works, and is experimented for verifying the results and it is proved that this research work is more efficient than the other existing systems. The first stage of the research work motivated to detect oils pills on the ocean using SAR images. Here it uses three different internal processes like super-pixel calculation, clustering the pixels, partitioning the image for fast comparison for oil spill detection. The main advantage of this stage is to provide proper detection and accuracy for different condition based SAR images from 96.89% to 98.98%. In the second stage of this research work it is aimed to obtain accurate oil spill detection. From the experimental results it is clear and noticed that the obtained oil spill detection is more

accurate and decided that the proposed ACADS is more suitable for oil spill detection. In the third stage of the research work, the performance of the proposed MSVM based oil spill detection system is evaluated and analyzed in terms of accuracy, sensitivity and specificity metrics. Comparing with the existing ANN, CPF and SVM methods, the proposed DT-MSVM method provides the best results. From the results and discussion it is noticed that the accuracy of the proposed approaches given in each stage of the research work is more efficient.

8.2 Scope for further Study

The present study tries to design a novel methodology, namely, AETC for oil spill detection from SAR image. This is compared with the CHV-RVM methodology that supports existing approaches. The analysis work based on this is also verified by the input images that vary regarding size, resolution and GIS information and compared with the various data set approaches which give an adequate result. SAR image is given as input of preprocessing, where the speckle noise is eliminated and segmented by cluster technique and the pixels selected for region identification and contour segmentation. Additionally, the segmented image is extracted by CHV extraction technique. This support these detection methods, the oil slicks, and lookalikes are identified and measured and then distinguished by RVM classification method. The novelty of this paper is to reduce the false alarm regarding detection and classification accuracy by using the lowest and highest threshold values of the SAR images by which maximum part of oil spills in the coastal areas are detected. The performance of the projected RVM based oil spill detection system is evaluated and analyzed concerning the accuracy, sensitivity, specificity. The projected CHV-RVM methodology provides the best results than the existing method. It gives a scope for further research to the coastal monitoring system. The study can be extended by calculating the area of the affected region and for providing alerts to the Early Warning System (EWS) in environmental monitoring and to predict the future environment scenarios to provide protection based activities.