IGARSS 2015: Remote Sensing: Understanding the Earth for a Safer World, Milan, Italy, 26-31 July 2015

Bilge dump detection from SAR imagery using local binary patterns

[yz] L.W. Mdakane,[yz] W. Kleynhans,[yz] C.P. Schwegmann

[y]Department of Electrical, Electronic and Computer Engineering, University of Pretoria, South Africa

[z]Remote Sensing Research Unit, Meraka Institute, CSIR, Pretoria, South Africa
lmdakane@csir.co.za

Abstract

Accidental or deliberate bilge dumping presents a major threat to the sea ecosystem. We present a semi-automatic approach to detect bilge dumping in synthetic aperture radar (SAR) images. The approach consists of three main parts. Firstly, areas with high probability of being bilge dumps are detected using Local Binary Patterns (LBP) with an adaptive threshold. Secondly, features are extracted from the detected dark spots and lastly, the features are analysed using bilge dump database to discriminate dark spot as bilge or not bilge. The automated approach was investigated on nine visually inspected images of SENTINEL 1A and ENVISAT Advanced Synthetic Aperture Radar (ASAR) images. The performance was measured by comparing the number of detected bilge dumps using the automated approach with the visually detected database. The automated detection approach showed to be a good alternative of the labour intensive manual inspection of bilge dumps, particularly for large ocean area monitoring.