ABSTRACT

It is known that one of the most critical issues for the implementation of a fully automatic processing dedicated to the detection of oil spills from SAR imagery is the extraction of the oil spill candidate. In fact, the segmentation of the image is the first of three necessary steps, the other two being the characterization of the extracted black spot by using a set of features and the classification between oil spill and look-alike.

In this paper we investigate an unsupervised neural network approach for automatically extracting oil spill candidates from ERS and ENVISAT SAR images. The technique is based on the use of Pulse-Coupled Neural Networks (PCNN) which is a relatively novel technique based on models of the visual cortex of small mammals. When applied to image processing, it yields a series of binary pulsed signals, each associated to one pixel or to a cluster. In literature, interesting results have been already reported by several authors in applications of this model to image segmentation, including, in few cases, the use of satellite data.