OceanView: A Maritime Surveillance System

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Abstract

With the recent implementation of Homeland Security due to terrorist threats, the coastline of the United States is becoming increasingly a vulnerable target. While airports maintain relatively high security, a similar monitored effort is lacking in the nations seaports. Tracking and surveillance of shipping in and out of ports can be an enormous task, but with more sophisticated means such a satellite remote sensing, this effort could be quite manageable, similar to air traffic control systems for airports. OceanView provides automatic ship detection from readily available, commercial satellite imagery for use in law enforcement at sea, and at a fraction of the cost of conventional surveillance methods such as aircraft and surface ships. Designed to operate within the processing queue of a satellite ground system, the system assigns a ship probability score to detected maritime objects based on the value of parameters it calculates for each detected object. In the case of SAR imagery, parameters include: length, width, heading, radar cross-section (integrated brightness), position (line pixel or latitude/longitude), peak brightness, and ratio of object brightness to mean neighborhood brightness. Once the results have been reviewed using the OceanView interactive editor, image analysts may then generate and distribute reports in the NATO standard OTH−GOLD format and in the form of a web page with imagery available worldwide from an encrypted web site. The entire process, from data downlink to report generation, requires little human intervention and takes well under an hour for SAR data. Because the operations occur in near real−time, land and sea forces can be immediately mobilized to intercept suspect vessels. Recent test results will be presented to demonstrate the versatility of the OceanView system.