

OBSERVING AND RECOGNIZING OIL SPILL USING MODIS IMAGE OBTAINED BY SATELLITE.

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Abstract—Oil pollution at sea level is one of the most dangerous and destructive(critical), MODIS offers day and night high resolution pixel images and it is not influenced by the existing of dark cloud cover, dusty particles or smoky area over the scene. In particular, multispectral sensors like MODIS offer a high number of spectral bands to recognize, identify and describe an oil spill act, and certify daily image frequency. However, optical sensors are highly dependent on meteorological conditions over the study area, they offer only low and medium resolution images and, finally, the devoted algorithms for image processing do not occur at present. For these reasons, the optical sensors play only a subordinate role with reference to SAR sensors. This work shows the outcomes through the development of devoted algorithms for automatic image processing from MODIS data, and a method to allocate and describe oil spill acts.

Index Terms—MODIS, BMP, SAR sensor.

I. INTRODUCTION

In our project we are trying to control Oil Spill. Due to Oil Spill all marine lives are in danger so we need to stop or need to minimize Oil Spill so, we are developing a software which controls the Oil Spill area that is "Oil Spill Detection".

Here, we are using MODIS Image in place of using Sensors. After taking image through satellite we have to read an image i.e., software will read an image and then apply algorithm on it, then it will try to match the pixel color, values, of each pixel in an image etc. If the match is found it will go for next pixel and the process will be repeated till we find the full Oil Spill Image.

It will identify the Oil Spill area related to some characteristics of Water and Oil like Reflection, weight, temperature, etc. Because of all these properties we can easily compare between water and Oil.

II. LITERATURE SURVEY

Hu(Hu et al., 2003) studied the possibility of successfully using MODIS imagery to detect oil spills in estuary areas, with several images per week and despite the limitations imposed by weather conditions, with no data cost. Ma (Ma et al., 2009) and Lammoglia (Lammoglia & Filho, 2010) defined the spectral signature of oil spills, basing their studies on laboratory experiences and theoretical models, aiming at isolating the regions of the electromagnetic spectrum suitable for their detection and description.

Oil reflection ability highly obtained on oil class (oil-refining degree) and its thickness: generally oil's reflection characteristic is higher than that of pure water (with few exceptions for some classes of heavy oil or for oil spills characterized by a thickness less than 150 micro meter) and the lower the wavelength used the higher the spectral differences. With reference to the visible region of the spectrum (VIS), the most interesting wavelengths fall in the range between 380-730 micro meter.

Taking into account the atmospheric disturbance, the detection of oil spills could be successful for wavelengths in the range between 500-730 micro meter. Inside the near infrared region (NIR) of the spectrum two reflection peaks exist, located respectively at 1.2 micro meter and 2.0 micro meter. In both cases great differences are clearly visible and depend on different classes and thickness of oil sample, thus these two spectral bands could be used to characterize the oil spill event. The water of Mexico was oil spilled between April 20 and September 19, 2010 was the largest offshore spill in U.S. history. Computer algorithms need to be formed to map contaminated areas due to oil spill.

A. Disadvantages of previous work:

- In above Details two sensors are combinedly used to Obtain good high quality operation of finding oil spill area.
- But there are few issues with these sensors. So, In previous system sensors were used which is SAR(Synthetic Aperture Radar) sensor. This sensor required more hardware which increases the complexity of software. This sensors does not work good in poor weather condition, if there is cloudy or high rain then using sensors it is not possible to take clear and high quality input image.
- Its uses Sensors. Sensors does not work properly as per the requirement of image. They do not capture perfect image in poor weather. Sensors were used in previous oil spill detection software.

- Does Not Work In Bad Weather Conditions. When there is storm or rainy weather the image obtain are not clear.

III. PROPOSED WORK

Through satellite we are going to extract a image as a input which will be in format of BMP(Bitmap). After extracting image then it will read full image and it will read each and every pixel of that image one by one and then it will display image as whole. It will compare every pixels with respect to colour,values. After reading all pixel of image it will set values to each pixel called as Threshold Value.

These all threshold values are compared with already observable threshold value. After comparing both image pixel we need to apply algorithm on that image.

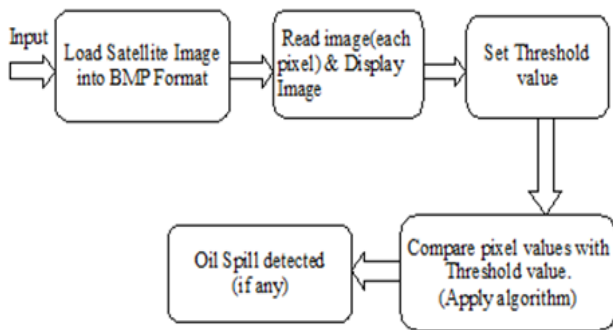


Fig. 1. Basic Block Diagram of Proposed System

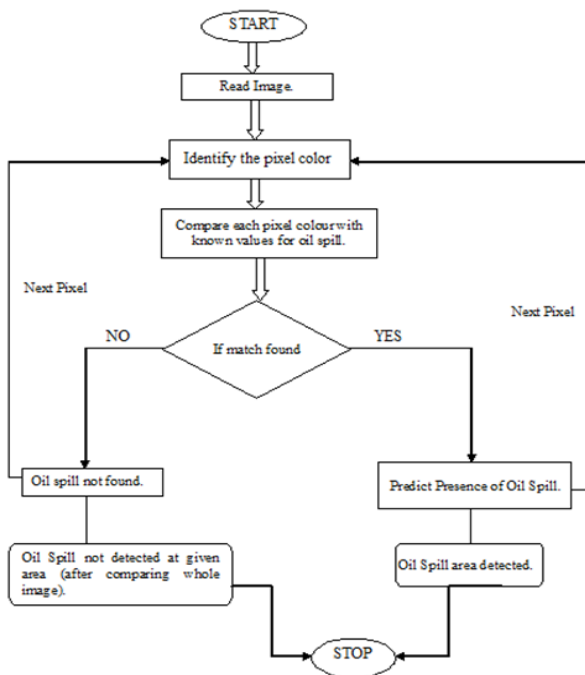


Fig. 2. Flowchart of proposed system

Algorithm used for Recognize Oil Pixel:

Step 1. Read image.

Step 2. Identify color of pixel.

Step 3. Compare pixel color with known values for oil spill.

Step 4. If any match found, predict presence of Oil Spill.

Step 5. Repeat Step 2 to 4 for next pixel till last pixel is read.

A. Advantages of proposed work:

- Extra hardware not required. No need to use extra hardware such as sensors.
- Clarity and Quality of MODIS Image is better. Good and high quality images are captured.
- Provides link for capturing MODIS Image of area. It will provide the link from where to download satellite images.
- Not affected due to poor weather condition hence, works in every weather condition. Gives perfect image in any type of weather.
- Appropriation in detecting Oil Spill area. It provides specific area where there is oil spill.
- Due to Oil Spill detection, we try to save marine lives, grass. This is the important factor mostly for all those who are in import and export carried out on seaways.
- Diseases spread due to Oil Spill can be in control or minimizes.

IV. CONCLUSION

This study proposes an automatic image processing analysis of MODIS data to overcome the drawbacks of SAR sensors and Optical sensors. We will be using MODIS image which is obtained by satellite. After obtaining image it will be used in software as a input image.

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