

UTILIZATION OF LEE AND GAMMA FOR MAPPING OIL SPILL
SPREADING USING SAR IMAGES

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**UTILIZATION OF LEE AND GAMMA FOR MAPPING OIL SPILL
SPREADING USING SAR IMAGES**

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LIST OF ABBREVIATIONS

APC	Antenna Pattern Correction
DN	Digital Number
FGAMMA	Gamma Algorithm
FLE	Lee Algorithm
GCP	Ground Control Point
MACRES	Malaysian Centre for Remote Sensing
SAR	Synthetic Aperture Radar
SLAR	Side-Looking Airborne Radar

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ABSTRACT

The main objective of this study is to utilize Lee and Gamma algorithms in oil spill detector mapping. Oil spill is a major problem occurs in the sea that causes pollution to the marine environment. Remote sensing is used to prevent this incident. In this study, Synthetic Aperture Radar (SAR) is used for oil spill detection. SAR is an active remote sensing system where the SAR images that will be used in this study come from Radarsat. Two algorithms were used in this study. Lee adaptive filtering (FLE algorithm) and Gamma map filtering (FGAMMA algorithm) also called adaptive filter. Adaptive speckle filter is more successful in preserving image information compared with non-adaptive speckle filters. This study also to show the function Lee and Gamma algorithm in produce a different result of patterns recognition on SAR data. The analysis is done by two process, these processing are called pre-processing and post-processing. The best result for both of algorithms with using window 7x7. Gamma Algorithm was found to be good result in spreading oil spill compared to Lee Algorithm that has successful in extracting linear features.

ABSTRAK

Objektif utama dalam kajian yang dijalankan adalah untuk menggunakan Lee dan Gamma algoritma dalam menentukan tumpahan minyak. Tumpahan minyak merupakan masalah utama yang selalu berlaku di laut dan menyebabkan pencemaran ke atas persekitaran marin. Penderiaan jauh digunakan bagi menyelesaikan masalah ini. Dalam kajian yang di jalankan, Synthetic Aperture Radar (SAR) digunakan untuk menentukan tumpahan minyak. SAR merupakan penderiaan jauh yang aktif dan imej yang digunakan dalam kajian ini diperolehi dari Radarsat. Dua algoritma digunakan dalam kajian ini iaitu 'Lee adaptive filtering' (FLE algoritma) dan 'Gamma map filtering' (FGAMMA algoritma) yang juga dikenali sebagai 'adaptive filter'. Penggunaan 'Adaptive speckle filter' adalah yang terbaik dalam memelihara maklumat yang terkandung di dalam imej berbanding dengan penggunaan 'non-adaptive speckle filter'. Kajian ini juga bertujuan untuk menunjukkan perbezaan fungsi antara penggunaan Lee dan Gamma algoritma. Analisis yang dijalankan terbahagi kepada dua proses iaitu 'pre-processing' dan 'post-processing'. Keputusan terbaik yang diperolehi untuk kedua-dua algoritma adalah dengan menggunakan tettingkap 7×7 . Gamma algoritma didapati memberi keputusan terbaik di dalam menentukan penyerakkan tumpahan minyak berbanding dengan penggunaan Lee algoritma yang memberi kesan terbaik dalam penentuan ciri-ciri linear.