Jyothi Engineering College
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A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR
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NBA accredited B.Tech Programmes in Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering and Mechanical Engineering valid for the academic years 2016-2022. NBA accredited B.Tech Programme in Civil Engineering valid for the academic years 2019-2022.

Ship Detection Using SAR Imagery

Group No. : 17

Department of CSE
Jyothi Engineering College
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Group Members

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Guide : Mr. Anil Antony

Vision of the Department

- Creating eminent and ethical leaders in the domain of Computational Sciences through quality professional education with a focus on holistic learning and excellence.

Mission of the Department

- To create technically competent and ethically conscious graduates in the field of Computer Science and Engineering by encouraging holistic learning and excellence.
- To prepare students for careers in Industry, Academia and the Government.
- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.

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- Objective of the project
- Problem Statement
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Introduction

- In this project we present an innovative way to detect ships in the ocean using SAR image
- Detection of ships is complicated, especially under unfavourable conditions, such as during night-time or on cloudy days
- Locations of ships in the ocean can be useful in many situations like finding route,search & rescue, surveillance, fisheries management, etc.

Objective

- To create a methodology to detect ships in the ocean using SAR data
- Estimation of size and location of ships in open sea
- To create ship hotspots and maritime routes with minimal traffic

Problem Statement

- As it stands it is very difficult to detect ships in the ocean area and accurately estimate its size and route.
- Using SAR we can scan for ships and determine its characteristics
- Our project aims to mitigate this problem

Area Of Project

- Image Recognition
- Deep Learning
- GIS

Skills Required

- Understanding of Deep Learning and Image Recognition algorithms
- Good knowledge about GIS
- Intermediate coding skills

Conclusion

- SAR images are less influenced by time and environmental factors making it optimal in comparison to optical images
- This makes it suitable for not only monitoring ships but also any other surface level activity
- Our project helps maintain a real time surveillance of ships with its size and route

Seminar Topic

Name : Nithin Peter

Topic : Ship Detection Using YOLOv3

Abstract

YOLO is a network for object detection. The detection task consists in determining the location on the image where certain objects are present, similarly as classifying those objects. You Only Look Once v3 (YOLOv3) can be optimised to be used for ship detection. This algorithm makes it possible to do real time ship detection in an efficient manner. Previous methods for this, like R-CNN and its variations,used a pipeline to perform this task in multiple steps. YOLO does it all with one neural network.

Name : Jevin Pauly

Topic : Pattern Detection using SAR images

Abstract

Remote sensing of the Earth surface is a very wide area of research. In context of image formation, synthetic aperture radar (SAR) technique has a special place. It allows to obtain high resolution imagery in real-time under various weather and lighting conditions. Using moving target displacements from a sequence of single-look SAR images and image stitching using local feature descriptors, we can get approximate routes of moving targets.

Name : Tessa Shyju

Topic : Ship detection using CNN

Abstract

Convolutional neural network (CNN, or ConvNet) is a class of deep neural networks, most commonly applied to analyzing visual imagery. Detection of ships is complicated, especially under unfavourable conditions, such as during night-time or on cloudy days. By using a Convolutional Neural Networks (CNNs) method, the Faster R-CNN VGG16 in a SAR based image can increase the accuracy of identification detection results as compared to traditional image based object detection methods.

Thank You