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Sensing the Sea Environment with Various Animal Models and Levels of Sophistication

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Introduction

Currently, a significant amount of research is focused. Here, capable of detecting Marine Debris. Is the first dataset based on the multispectral satellite data, which distinguishes Marine Debris from various marine features. Plastic debris events in multiple geographical places around the world over various seasons, years, and sea state circumstances. The dataset is thoroughly analysed spectrally and statistically. Well established ML baselines for weakly supervised semantic segmentation and multi-label classification tasks are presented [1].

Description

an open access dataset that the spectral behaviour of specific floating materials, sea state features, and water types, as well as develop and test Marine Debris detection solutions based on artificial intelligence and deep learning architectures, as well as satellite pre-processing pipelines. Plastics, for example, are a big global issue with significant environmental, economic, human health, and aesthetic implications. Plastics remain in the ocean for a long time and have been detected in a variety of locations throughout the world, damaging marine life at various trophic levels [2]. Several solutions for detecting and preventing marine debris have been developed and proven [3]. Detecting and monitoring floating trash has recently captured the focus of the majority of research and development activities. Earth observation data from governmental and commercial satellite projects, as well as remote sensing data from manned aircraft, unmanned aerial vehicles, bridge-mounted, and underwater-cameras, have been used in particular for detecting and tracking Marine Debris. Spectral indices, such as the Floating Debris and the Plastic that have been established based on fake plastic targets, have also been proposed to improve the detection of Marine Debris using multispectral satellite data [4].

Furthermore, hyperspectral measurements have been carried out to better understand the spectral behaviour of marine debris, with the goal of investigating sensors' capabilities in separating plastics from other features such as flora, natural material, and water. Investigating Marine Debris characteristics, including spectral behaviour, has also been done using multispectral satellite data, demonstrating that spectral separation of Marine Debris from other sea surface objects such as ships and foam is difficult. Indeed, distinguishing floating plastic garbage from bright characteristics such as waves, sunlight, and clouds is now considered extremely difficult. This is because plastics have complicated qualities that vary in colour, chemical composition, size and depth of water submersion. A high quality dataset can address the aforementioned problems while also assisting in the development and improvement of Marine Debris identification algorithms [5].

Conclusion

Despite the hard and ever-increasing issue of marine debris, the currently available datasets are rather few in number and do not often use open-access high-resolution satellite data over geographically large areas. These facts preclude the use of satellite data in ML frameworks and operational solutions. Furthermore, the majority of the currently available marine remote sensing datasets are aimed at recognising specific items such as vessels. With a limited number of classes, datasets for cloud detection over the ocean and Sargasso microalgae extraction have also been developed. To that end, our research attempts to close the gap with a new, open-access benchmark dataset called Debris Archive, which is based on the S2 multispectral satellite. The created dataset takes a unique step forward by including sea features that coexist in the ocean. Remote sensing photos, resulting in a total of thematic groupings. Along with, baselines for the poorly supervised semantic segmentation challenge, including shallow and deep neural network designs, are offered.

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