Thursday, October 11
Poster Session 4
10:30–12:00

Poster 164

DEEP LEARNING MODEL FOR BENTHIC CLASSIFICATION FROM REMOTE SENSING REFLECTANCE

Deep learning and Artificial Intelligence have been described as the new electricity. In recent years, the use of deep learning has achieved state of the art performance in fields such as computer vision, natural language processing and image segmentation just to name a few. Deep learning is driving new innovation in self-driving cars, the manufacturing sector, gaming, precision medicine and various analysis. Google's deep learning model, AlphaGo, is now able to beat a human Go grandmaster. As the volume of available data increases, machine learning models continually achieve greater than human level accuracy. Currently, remote sensing optical models are built using an understanding of optical radiative transfer. These models can be complex and computationally intensive for computers to solve. One advantage of using a machine learning model is, the model does not need to know anything about optical physics. Machine learning models are universal function approximators. Using deep learning, the computer discovers the best model based purely on the training data it is provided. As such, these models are able to discover much simpler and faster models with comparable recall accuracy. In this paper we present a data driven, optical model, built with no prior knowledge of radiative transfer or prior domain specific knowledge. The model was trained using simulated and labelled remote sensing reflectance spectra. The deep learning model is able to accurately classify benthic class from remote sensing reflectance. All of the source code and data are published in a jupyter notebook on Github under creative commons licence.

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