

Deep Learning in Pelagic Imaging: Advancements and GEOMAR's Role in the HFMI AqQua Project

Friday 22 November 2024 09:50 (40 minutes)

Pelagic imaging, the capture of images of plankton and particles in the open-water zones of the oceans, is central for understanding plankton diversity, distribution, and dynamics on a large scale. The integration of deep learning (DL) into pelagic imaging workflows offers the potential to improve the precision and scalability of image-based analyses in plankton research.

This talk will first review our recent work in advancing automated image analysis methods tailored to address the challenges of species classification, trait extraction, and image annotation in plankton studies, focusing on the development of MorphoCluster, a cluster-based, interactive image classification tool. Key results indicate that MorphoCluster surpasses traditional methods in sorting accuracy and annotation speed.

Building on this foundation, the talk will outline GEOMAR's part in the upcoming HFMI AqQua project, a joint initiative of Helmholtz institutes to create a versatile deep learning model for plankton image recognition, trained on billions of images from diverse instruments.

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