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## A deep learning pipeline for automatic microfossil analysis and classification

Iver Martinsen<sup>1</sup>, David Wade<sup>2</sup>, Benjamin Ricaud<sup>1</sup>, and Fred Godtliebsen<sup>1</sup>

<sup>1</sup>UiT - The Arctic University of Norway

<sup>2</sup>Equinor ASA

Microfossils are important in climate analysis and in exploration of subsea energy resources. The abundance and distribution of species found in sediment cores provide valuable information, but the analysis is difficult and time consuming as it is based on manual work by human experts. It is also a challenge to have enough labelled data to train a standard deep learning classifier on microfossil images. We propose an efficient pipeline for processing and grouping fossils by species from microscope slides using self-supervised learning. First we show how to efficiently extract crops from whole slide images by adapting previously trained object detection algorithms. Second, we provide a comparison of a range of contrastive self-supervised learning methods to classify and identify microfossil from very few labels. We obtain excellent results with convolutional neural networks and vision transformers fine-tuned by self-supervision.