Plankton image classification using convolutional neural networks

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Résumé

Plankton microorganisms are among the most important players in marine ecosystems. Studying the changes in plankton communities under environmental perturbations is essential to better understand the effects of environmental changes to marine ecosystems. Large image datasets of plankton acquired by emerging imaging devices (e.g., FlowCam and Zooscan) have the potential to document plankton dynamics. In our work, we investigate such changes using deep learning methods, such as convolutional neural networks (CNNs), for image classification, testing different CNN architectures. To evaluate the performance of CNN classifiers, we study the influences of different hyperparameters such as number of hidden layers and units, network weight initialization, learning rate, number of epochs and batch size. Then, we will discuss the performance of CNN classifiers with other feature-based classification methods such as Support Vector Machine and Fast Random Forest.

Mots-Clés: plankton classification, image classification, Deep Learning, Convolutional Neural Network

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