Classifying Coral Species Using Machine Learning Algorithms

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In this study, investigated the efficacy of using machine learning algorithms to annotate images of coral reefs in Hawaii, with a particular focus on two coral species, Pocillopora and Porites. These species were chosen due to their ecological and economic significance in Hawaii and the Pacific region. To develop the algorithm, images of coral species were captured at La'aloa State Park beach, which is a popular site for coral reef research in Hawaii. To reduce bias, minimal preprocessing techniques were applied to the images. Specifically, each image was cropped to a square shape, and those that lacked coral or were blurred were excluded from the dataset. The resulting images were sorted and labeled according to their corresponding species. Using Matlab, an algorithm was developed and refined to achieve high accuracy levels for both Pocillopora and Porites. To test the algorithm's accuracy, 80% of the images were used for training, while the remaining 20% were allocated for testing purposes. The results showed that the algorithm for Pocillopora yielded an average accuracy of 82.59%, while that of Porites was 86.59%. These findings demonstrate that machine learning algorithms can be effectively employed to annotate images of coral reefs in Hawaii. While this study provides evidence for the effectiveness of machine learning algorithms in annotating coral reef images, further experiments are necessary to assess the scalability of this approach for a larger dataset of coral reef images. If successful, machine learning algorithms could provide an efficient and cost-effective tool for monitoring the health of coral reefs and inform conservation efforts in the future.

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