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DETECTING, TRACKING AND CLASSIFYING ANIMALS IN UNDERWATER VIDEO

We deploy remotely operated vehicles equipped with high resolution video cameras enabling quantitative video transects (QVTs) to be obtained that provide ecology data at the scale of individual organisms. QVT sampling advances studies in animal diversity, distribution and abundance. Analyzing QVTs, however, is labor intensive and costly, limiting marine ecological research and application to aquatic management. In the current work, an automated program for detecting and classifying organisms processes video frames with a neuromorphic-selective attention algorithm, modeled after the human vision system. Candidate locations are identified and tracked to determine interesting detected events; these events are marked in the video frames and undergo further processing with an automated classifier to determine the abundance and distribution of representative species. We present comparison between professional annotations and automated detection of organisms in midwater and benthic transects. We present automated classification of organisms in benthic video footage. We present data on detecting animals in video from fixed observatory seafloor cameras.

SS09 CS01 CS28

Edgington, D.R.

Edgington, D.R., Cline, D.E., Mariette, J., Kerkez, I. Detecting and Tracking Events Automatically in Underwater Video. *ASLO Aquatic Sciences Meeting* Santa Fe, NM February 2007.