

# Image segmentation and supervised classification of marine bivalve valves from archaeological sites

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## Description

Archaeological assemblages of marine shell remains from shell-bearing sites can produce thousands of valves of bivalves species, such as *Cerastoderma galcum*. One of the standard archaeozoological methods to reconstruct ancient collecting strategies and estimate food resource practices is to estimate the number of bivalves based on the number of valves (one bivalve consists of two valves), to manually match right and left valves, and to make one by one size measurements on valves. These tasks are time-consuming and it is often difficult to compare different samples from one site.

The aim of the present study is twofold. Starting from a dataset consisting of digital photos of approximately 600 marine shells (both modern valves and archaeological ones), the following tasks should be accomplished :

1. implement an object detection and segmentation algorithm to detect and extract single shell images (as in Figure 1a and Figure 1b) from images with multiple shells (as in Figure 1c);
2. implement a supervised classification algorithm to classify single shell images as *left valve* or *right valve*.

The estimation of valves' sizes and the implementation of a method to pair *left valves* and *right valves* would also be strongly appreciated.

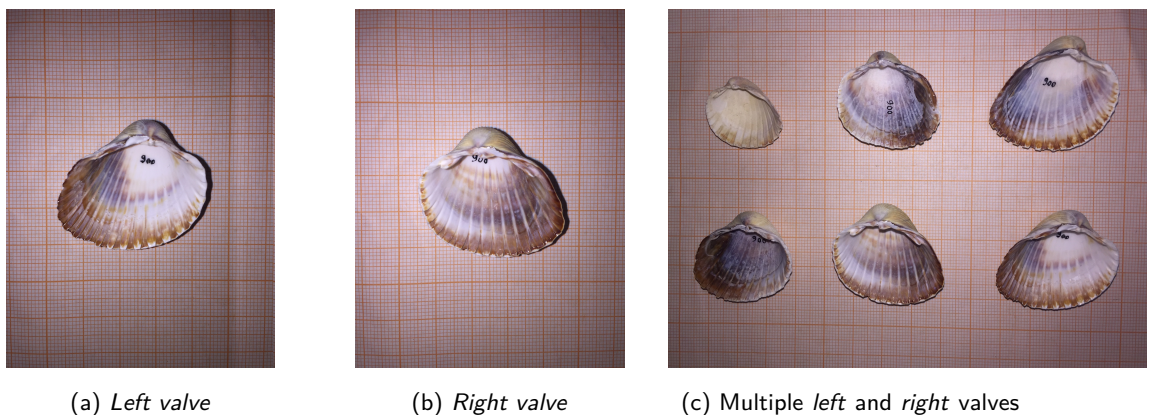


Figure 1: Example of database images