3D Models
from shipwreck remains
or old technical tests
Archaeologists try to reconstruct extinct cultures from the material remains of past human behavior.
Nautical archaeologists try to reconstruct ships from their archaeological remains, or from technical manuscripts.
1. From shipwrecks

a. Get good data: photogrammetry, FARO Arm scanning, accurate drawings.
b. Sites must be recorded in three orthogonal plans
A timber catalogue consists of a site plan and sections with all the timbers referenced, a list of the timbers referenced with the square where they were recorded, and a fiche with information on every timber.
A timber catalogue consists of a sketch book and a final, clean and edited, catalogue.
d. Careful drawings of the most important timbers

Typical recording includes:
1. Description;
2. Dimensions, such as length, sections, bevels;
3. Fasteners, with positions and direction;
4. Toolmarks;
5. Coatings, painting;
e. Developing partial 3D models
f. Developing a 3D model of the ship remains
Lines represent the lower surface of the floor timbers and first futtocks

C - Frames (stations)
WL - Waterlines
BL - Buttock lines
D - Diagonal
H - Total rising (1 room-and-space)
h. Faring lines

Lines from shipwrecks need to be faired. Ships’ remains deform, we make mistakes when we record their curves, and ships were imperfect. Our reconstructions are always tentative, based on truncated data, and stand as educated guesses.

Beatrice Fabretti, 2021
i. Developing a set of lines
j. Developing a set of construction drawings

Alex Hazlett, 2003
j. Developing a set of construction drawings
k. Evaluating the plausibility of our reconstruction

Nuno Fonseca, 2005
Manoel Fernandez

Written sometime in the late 16\textsuperscript{th} or early 17\textsuperscript{th} centuries, these “regimentos” (rules for the construction of a ship) were copied into a beautiful manuscript dated 1616 and signed by a guy named Manoel Fernandez, possibly a shipwright, and possibly made to offer to king Felipe III of Spain, when he visited Portugal, in 1619. The dedication was taken from the manuscript, possibly after the Portuguese independence, in 1640.
The manuscript has two parts: one with text and one with drawings, but not all texts have drawings and not all drawings have texts. Another copy of the original from which this manuscript was made shows that there are mistakes in the text. Some of the drawings are represented with different vertical and horizontal scales.
Reconstructions from these drawings require a lot of guess work. You have the profile of the ship, several frames, the shape and composition of the timbers of the decks, scantling lists, and in some cases details of particular timbers.
We are compiling the texts and drawings for a number of ships, and you can try to reconstruct them. It is an iterative process, so please be creative and don’t be afraid of making mistakes.
We are compiling sets of lines drawings that can be used to make a first evaluation of a ship’s size and shape.

We are collecting two types of hull lines: from technical documents and coeval ship models, and from tentative reconstructions of well-preserved shipwrecks.
From the 2D drawings we are developing a library of 3D lines drawings’ models. One day, we would like to automate this process.
From the 3D lines drawings’ models, we can try to hypothesize the range of sizes and shapes that might represent the ship we are trying to understand and reconstruct.