

No More Plastering

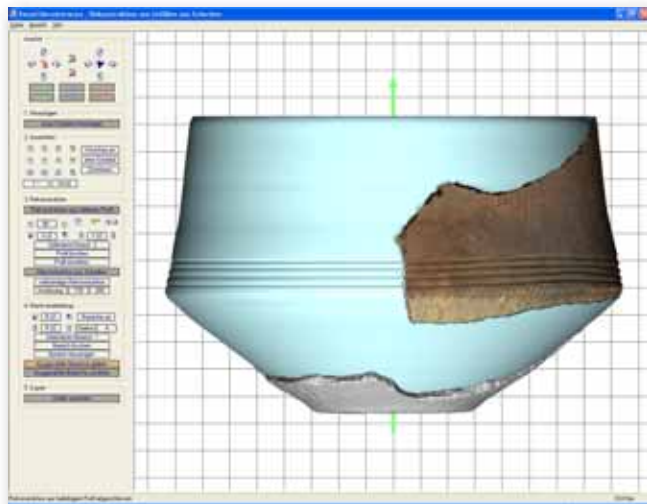
Broken and incomplete material makes up the main part of finds at archaeological excavations. Due to lowering budgets the restoration workshops can hardly handle this in the future. Nowadays only important troves are restored and if necessary reconstructed with plaster.

Although our system is suited especially for complete and reassembled finds, we also want to file sets of sherds. That's why we wish to reconstruct the original vessel or at least its approximate shape as far as possible by visual support.

The Vessel Reconstructor

Thus, in a further project a software for the reconstruction of vessels from sherds has evolved. The manual alignment of the sherds which is quite similar to the traditional way is supported by grids and concentric circles. After that, the user can interactively generate profile sections. Of course, also missing parts of better preserved vessels can be closed in that way.

By means of the reconstruction the overall optical impression of the vessel is significantly improved. Only now it possibly comes into question for a publication. However, in the archives the set of sherds requires much less space than the complete vessel.



Further information concerning the TroveSketch project can be requested at:



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TroveSketch
Software-Supported 3D Documentation
of Archaeological Finds

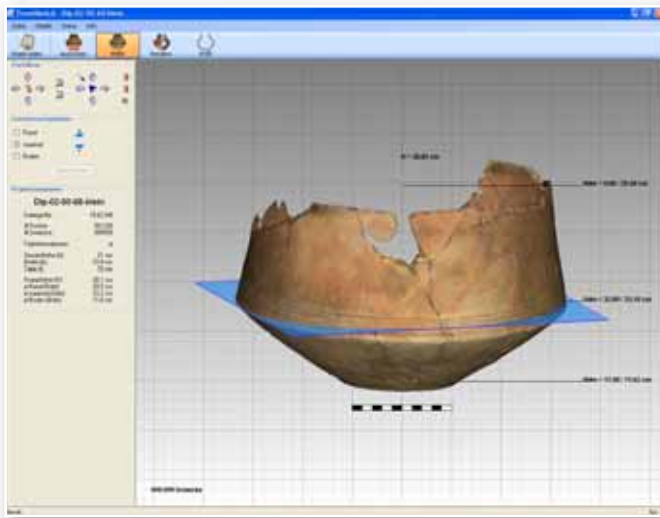
A NEW WAY FOR DOCUMENTATION

From the Sketch to the 3D Model and Back

Within archaeology the documentation of finds is an indispensable but time-consuming and hence cost-intensive process. However, traditional sketches often lack accuracy. Due to the subjectivity of perception as well as to the different abilities and styles of the drawers, sketching finds has always been an interpretive task. Sometimes the drawing directives even within a single excavation are inconsistent and so the results are quite inhomogeneous and often hard to compare. Besides, a drawing always comes along with a significant loss of information.

Regarding this, we developed a specific documentation software called "TroveSketch". It does not only afford the establishment of a quasi-standard but it can also considerably accelerate the storage and retrieval of objects. Instead of drawing two-dimensional ink sketches the troves are digitally captured by a 3D laser scanner covering colour information too. After that the virtual models are automatically measured and stored into a database. By this workflow we create a "dual reality": The original object is saved in a file with optimal content of information and can now be provided to everybody via traditional (printed) media or via the internet.

The generation of figures ready for publication including surface properties, break lines and if necessary colour information too, is possible within a comparably short time. In contrast to drawing and sketching where experience and talent play an important role, our program can be used also by non-professionals after a few hours.

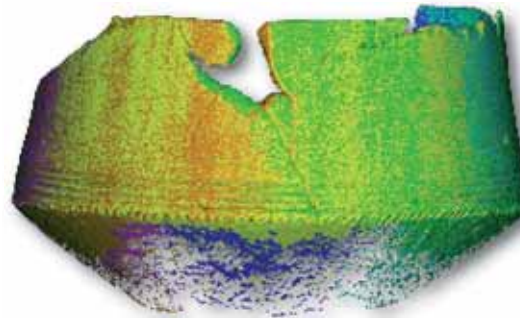


3D DATA CAPTURING

3D Laser Scanning



For the new, three-dimensional capturing and documentation of finds a laboratory was installed at the Landesamt für Archäologie (Saxony's Archaeological Heritage Service) where up to 30 objects can be digitized per day. Therefore, we equipped ourselves with the VI-910 laser scanner by Konica Minolta, the capturing software "PET" (Konica Minolta) and the commercial 3D modeler "Geomagic Studio 9" (Geomagic, Inc.).



At the end of the digitalizing process we have 3D models in well-known data formats like OBJ (Wavefront) or PLY. Our software packages "TroveSketch" and "Vessel Reconstructor" then aim at the further three-dimensional processing on the one hand and at the generation of two-dimensional figures on the other hand.

SCOPE OF FEATURES

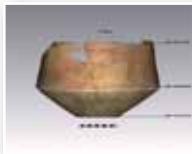
Automatic Alignment

TroveSketch uses several powerful algorithms to automatically align the vessels at the bottom surface and the rotational axis. Even though the program should be off the mark once, there is still the possibility of manual readjustment.



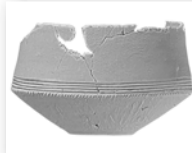
Automatic Measurement

The most important measures of the vessels like height, rim, bottom and biggest diameter are automatically extracted by the software. The laborious and less precise measurement with circular discs and rulers is now a thing of the past.



Rendering Standardized Images

To produce stylized 2D figures TroveSketch uses the newest algorithms from the field of non-photo-realistic rendering. These figures are now standardized and can be exported to many common picture formats with an arbitrary scale and a high resolution. Of course, this also applies for realistic coloured images. Last but not least the object can be shown from every single point of view.



Unrolling Vessels

Drawers often have difficulties with complex ornaments. Working with virtual objects, we can offer the opportunity to cut the vessels and unroll them into a plane. So, a panorama view is created within a second just by pushing a button.



Generation of Profiles

Also the traditional profile sketch is part of our set of features. In principal arbitrary cross-sections through the object are possible. Missing segments can easily be reconstructed. The resulting outline can be exported to the well-known EPS format.

