3D SCAN OF HIMYARITE RELIEF SCULPTURE IN ZAFAR, YEMEN

LINDEN SOFT Publishing
Heidelberg University
Zafar Expedition 2010

Reliefs such as these have never come to light before, and in situ! The uncertain preservation situation and great importance of the finds required very exact recor ding. The excavated 15 m long relief wall of Himyarite date in the Stone Building at Zafar complemented sketches, drawings and photos. Four horizontal rows of reliefs comprise rosettes and leaf-crosses, paradisiacal scenes, alternating grape leaves and grapes as well as frontal bucrania.

More interesting at the southern end, a 1.70 m high relief occurred of a frontally posed crowned man with a cross-staff in the left hand and a bundle of branches in the right. This is taken to be the sole surviving example of Christian art in South Arabia. By virtue of the find situation and Byzantine comparisons, it is taken to date to the early 6th century.

In September 2010 Joerg Lindenbeck M.A. from LINDEN SOFT Publ., Aichwald, Germany, joined the Heidelberg University expedition to Zafar to perfom the 3D recording of the reliefs.

Including the setup of the Konica-Minolta Vivid 910 with power generator, computer control and especially appropriate shading, the recording took about 18 hours.
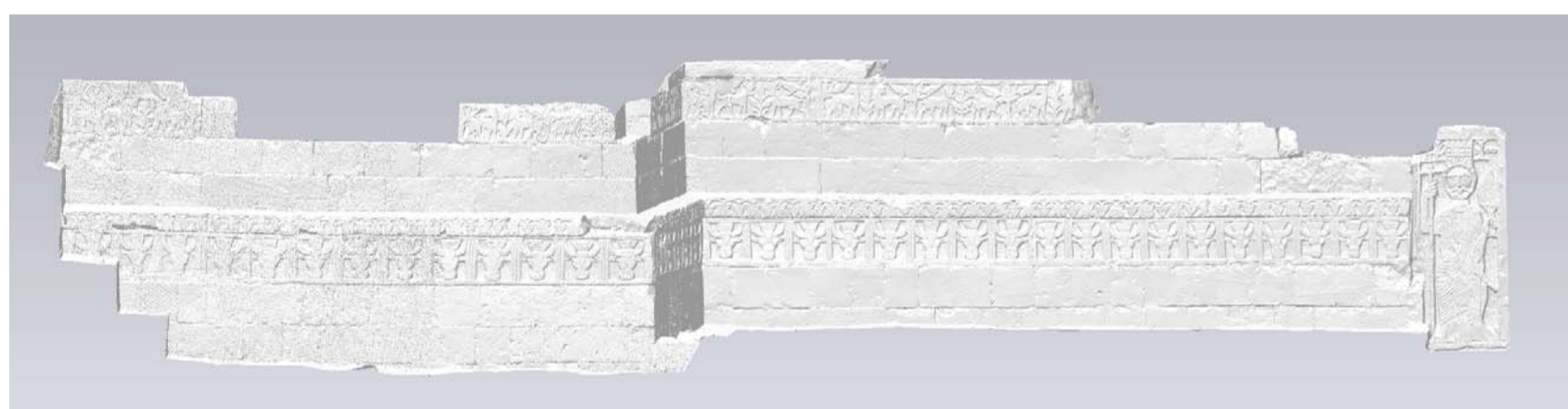
The three wall sections plus the statue of the crowned man were recorded by means of a total of 370 individual recordings taken from eight different positions.
The Vivid 910 needs about 15 seconds for a single shot in fine-mode with a speed of 20480 points/second, thus raw data of more than 100,000,000 measuring points were recorded.

The individual scans were registered and merged for each wall and then grouped and merged into a single object with 16,000,000 tesselations for the walls and another 6,000,000 for the crowned figure.
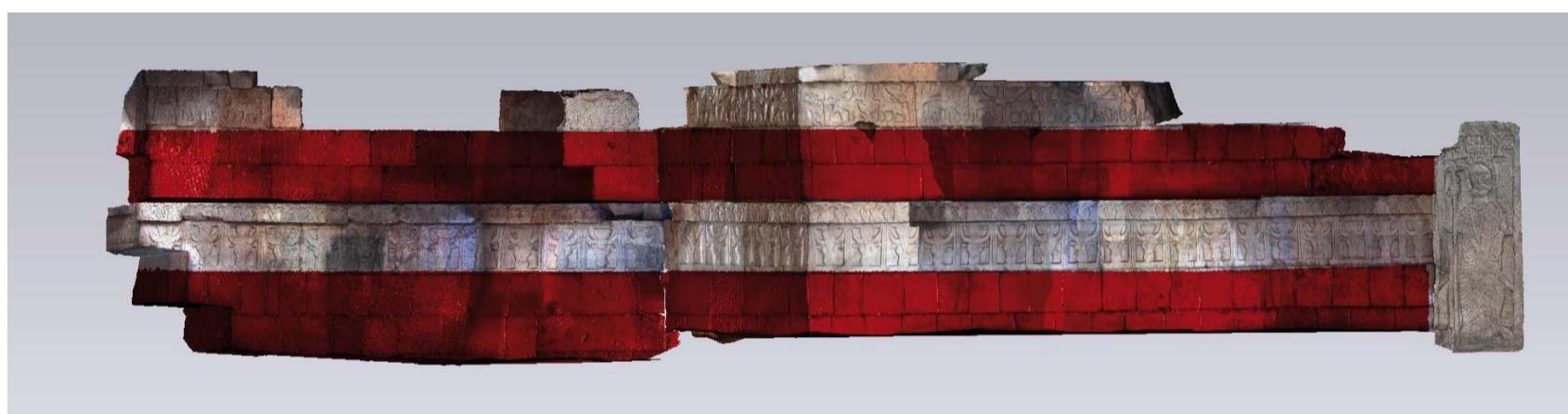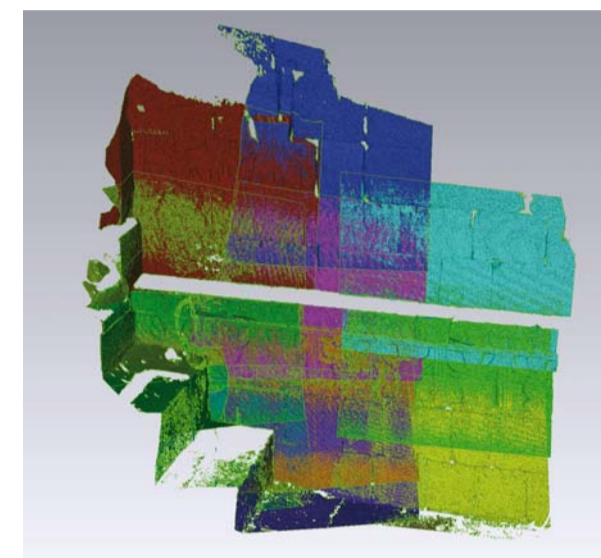
Horizontal zones of less importance (uncarved areas) were marked out and decimation (thinning) of the mesh was carried out to reduce the volume of data for the model down to 5,000,000 tesselations without compromising the details of the reliefs.

18 hours recording, 100,000,000 measurement points, 160 hours of CG works yielded two 3D models: the walls plus reliefs and the reliefs alone in a higher resolution, but taking the scanner in and out of Yemen remained the greatest challenge in this undertaking.

Since even shade was required during the scanning to provide the sensors with a working range, texture colour could not be kept at an even level (see picture above this one). Thus all the texture information that was recorded along with the 3D coordinates was removed and photographic images taken at more favourable light conditions were used for projection of the final texture on to the model (see left and below).

Heidelberg University,
Dept. of the Languages
and Cultures of the Near East
Paul Yule [paul.yule(at)t-online.de]

LINDEN SOFT Publishing
Seestr. 8, 73773 Aichwald, Germany
Joerg Lindenbeck [email(at)lindensoft.de]