

INTEGRATING  
STRUCTURE FROM MOTION PHOTOGRAMMETRY WITH AUGMENTED REALITY TOOLS  
AS A NOVEL TECHNIQUE  
FOR DIGITALLY RECONSTRUCTING AN ARCHAIC COLUMN

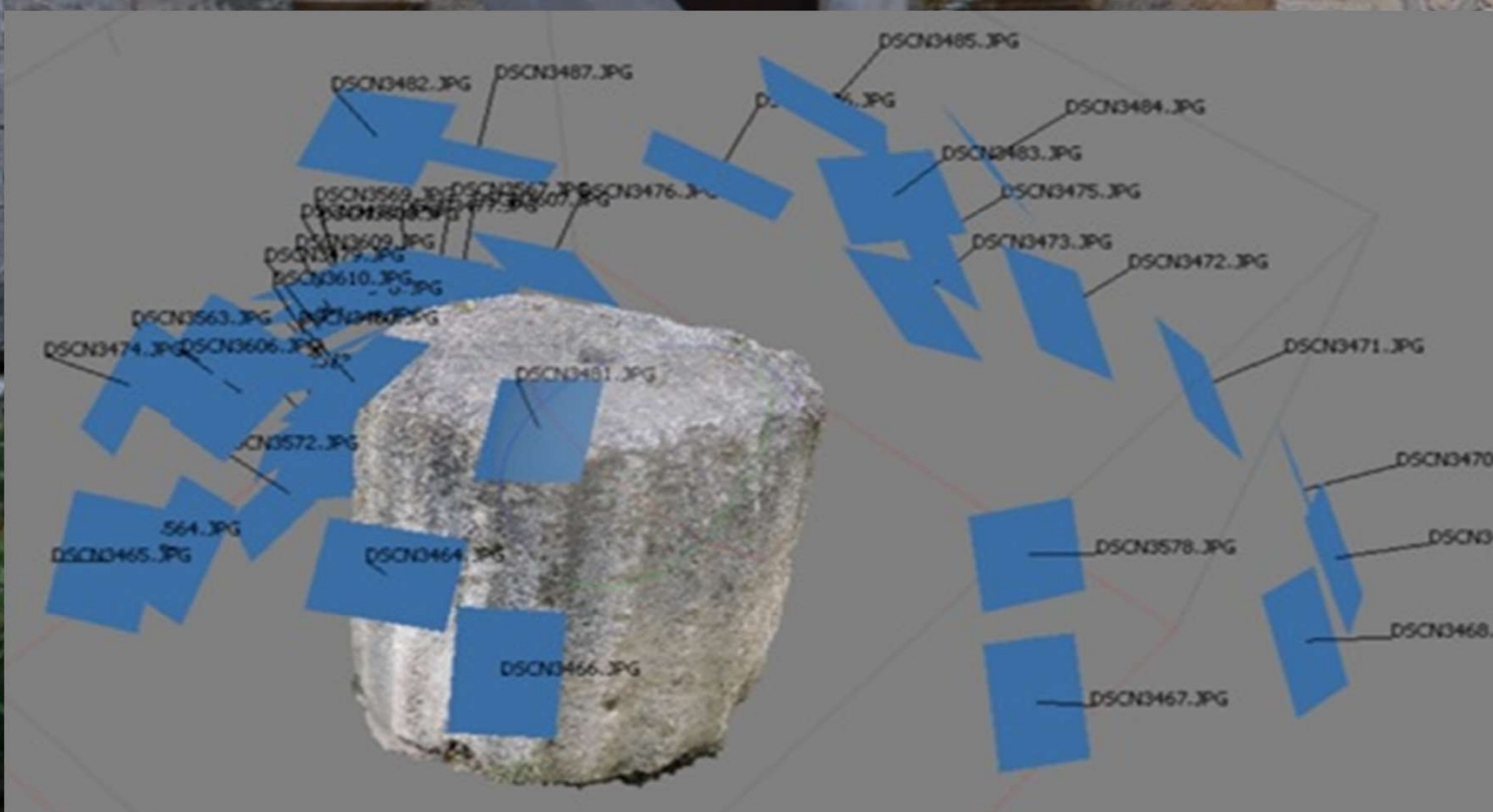


School of Architecture  
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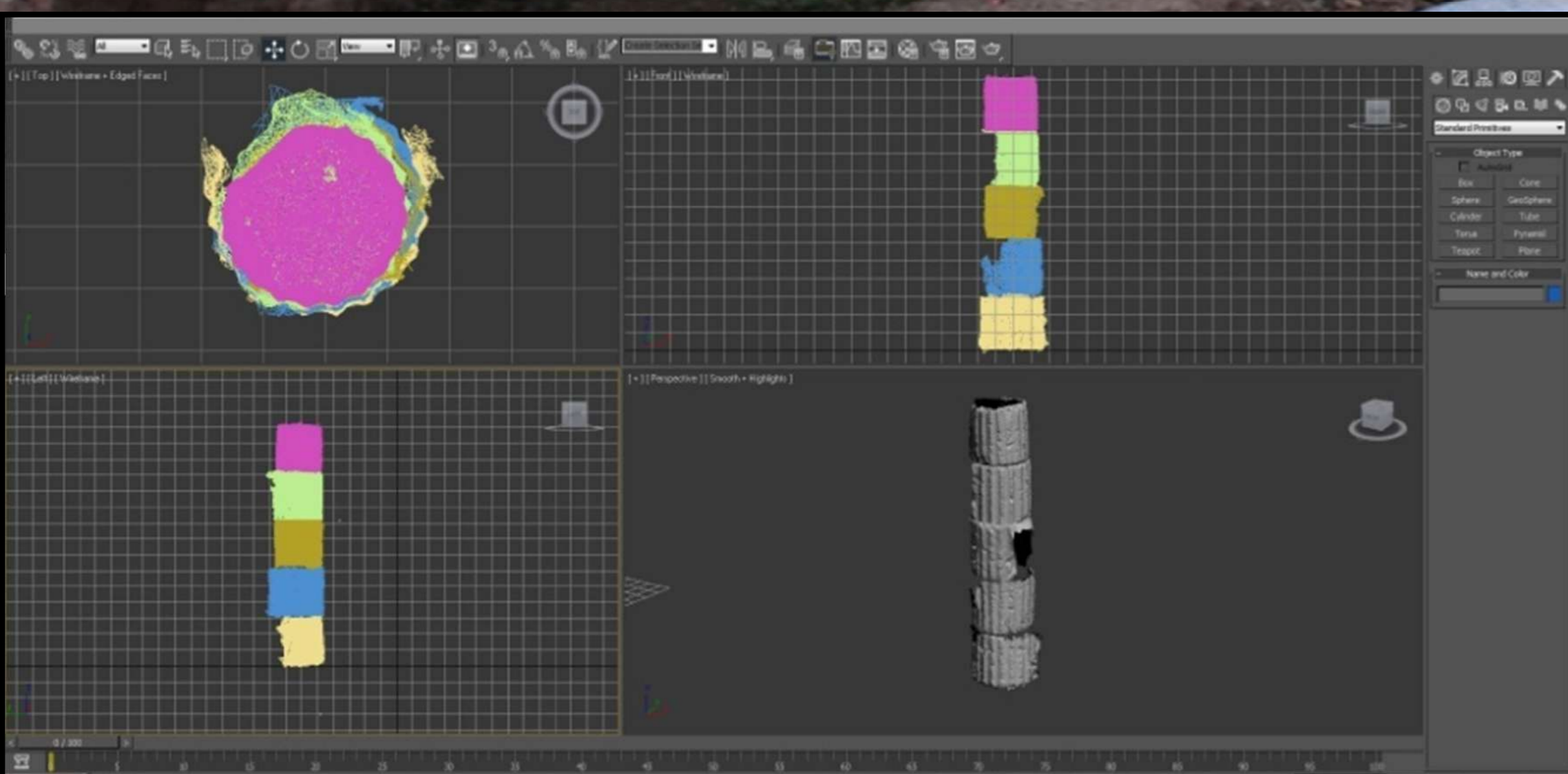
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## Abstract

This poster describes the research conducted at the Digital Media Lab, Technical University of Crete, in coordination with the Ministry of Culture of Greece, via Ephorate of Antiquities of Chania, for the digital reconstruction of an archaic column. The 3d models of five very heavy parts of an archaic column (constructed ca 540 BC) were used for studying and reconstructing the complete column. The 3D models that were produced with the Structure from Motion techniques, are being uploaded as .obj files into Google Tilt Brush. The user can then experiment by moving, rotating and scaling the individual 3D parts in a 3D environment in real time, thus drastically simplifying the digital reconstruction process for similar projects.



Positions of the cameras used for the 3D reconstruction

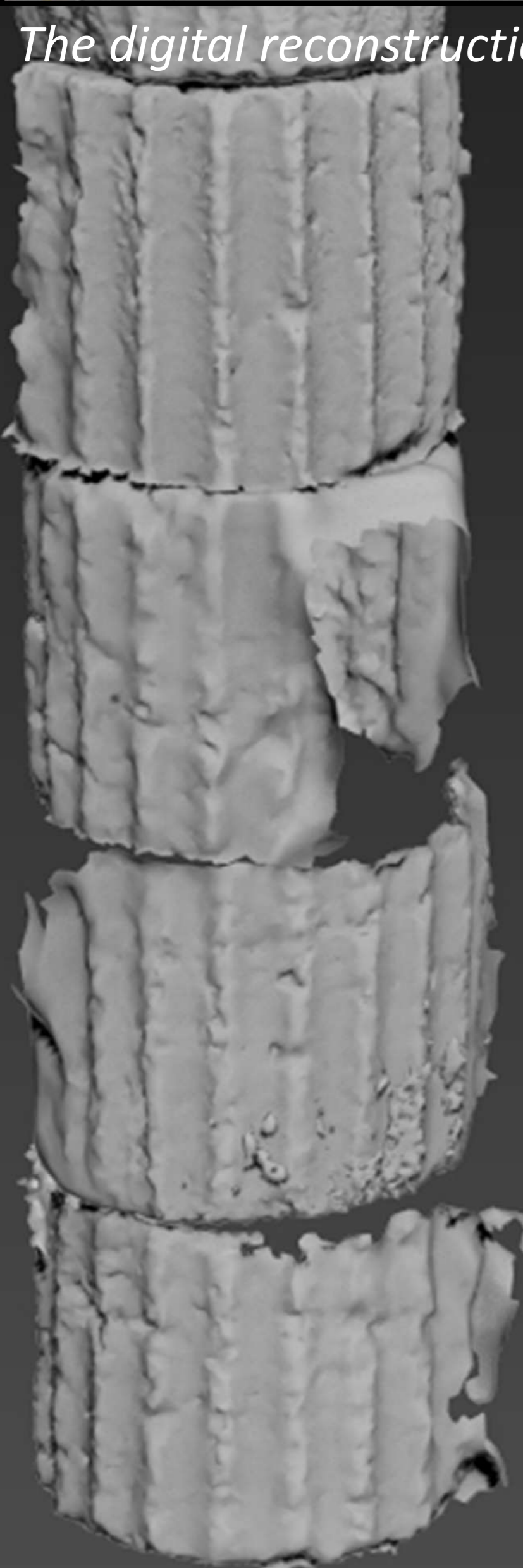


The digital reconstruction of the archaic column in 3ds Max.

## Methods

The five stone drums found in a salvage excavation in the town and were parts of a column which belonged to an archaic temple, unique in size and in type for the area of Chania, in West Crete, Greece. Now they are exposed in the yard of the old Archaeological Museum and the plan is that they get reconstructed in order to be properly exhibited in the New Archaeological Museum of Chania.

In order to produce the accurate 3D models we used Structure from Motion (SfM), which is a photogrammetric range imaging technique for estimating three-dimensional structures from two-dimensional image sequences. A different number of images of every object were added in Agisoft Photoscan software. For the photo shooting we used two cameras, a Nikon Coolpix P530 and a Canon EOS 700D. The images were chosen to be clear and 60% overlapped. We followed the steps of the Agisoft software controlling the parameters. The final five obj. files were imported in 3ds Max and merged into a single file. Meanwhile using the Google Tilt Brush the user can scale, move or rotate the 3D parts to reconstruct digitally the archaic column.



Using the Google Tilt Brush to scale, move and rotate the digital doric drums for the reconstruction of the archaic column.