

# From U.A.V. photogrammetry to 3D modeling of the Valencian Silo-Yard in Burjassot

## Introduction

The importance of recording and documenting cultural and archaeological heritage has provided the opportunity to integrate new technologies and other fields of science for their purpose. The incorporation of geomatics tools allows to generate precision and a wide level of detail in the capture and processing of information. The use of Unmanned Aerial Vehicles (U.A.V.) in order to capture of images around opened spaces with photogrammetric processes permit obtain high quality information. After the process this data, 3d model can be generated. This project applied this methodology in a heritage place in Spain called as Valencian Silo-Yard.

## Method and process

By using U.A.V. were taken the photographs of converging images towards the target. This was done with the intention of inserting all the images in the PhotoScan software of Agisoft to get a point cloud where all the elements of the structure are connected in the same reference system.

Once the image processing accomplished, the resulting DEM and orthophoto are checked, to ensure the level of precision of the generated images, the correct georeferenciation, and the resulting statistics.



*Orthophoto generated in Photoscan with U.A.V. images*

In order to complete the missing information on the facade of the constructions. The point clouds of the

U.A.V and the laser scanner were combined.

The unification of both clouds was done in Cloud Compare Software, using a rotation matrix whose adjust obtained mean distance estimated of 0.033 m, and standard deviation is estimated of 0.024m.

The modeling was done in 3D Reshaper from the cloud points processed and filtered. Eliminating all the wrongs points and the noise caused by objects foreign to the structure, people and overlap of scanners.

## Results

For modeling was taken into account the precision, conservation of details and preservation of reality of the silos. The texture was obtained from point clouds with color, images and orthophotos generated in PhotoScan and Photoshop.



*General View of the 3D Model*

## Conclusion

3D-modelling projects of historical monuments are crucial because they preserve the history and the culture. The integration of several methods of measurement and data capture allowed the integration of traditional technic with new technologies applied to precision engineering. In the case of the Valencian Silos-yard, it was an important place for the Valencian community, and thanks to the heritage recording, the knowledge about this place will be possible for the next generations.