**OptoCat**

**Texture Mapping for three-dimensional scan data**

Capturing and mapping the texture of a scanned object to its digital 3D representation – this is an add-on module of the high-performance measuring and evaluation software OptoCat. The texture mapping feature is particularly interesting for three-dimensional scanning projects in the field of arts and cultural heritage – or indeed for any user who requires a high resolution texture for the generated 3D data.

**How it works:**

This algorithm maps high-resolution bitmap information to each triangle of the scanned object with sub pixel accuracy, assigning several pixels per triangle instead of only single color information per vertex. The texture resolution is independent from the resolution of the object’s 3D data, allowing the creation of a reduced point cloud while maintaining a high-resolution texture.

**Easy workflow**

Thanks to the automatic texture mapping process in the OptoCat software, the internal images taken with the 3D scanner are directly transferred onto the 3D scanning object. The sensor data of previous OptoCat projects can be also used for texturing with the Texture Mapping module.

When using external imagery, the user first manually specifies the tie points before the automatic optimization and alignment process is started. The texture resolution is independent from the resolution of the object's 3D data, allowing the creation of a reduced point cloud while maintaining a high-resolution texture.

In addition to the commonly used data export formats STL and PLY, using the export format Wavefront OBJ can also be opened and processed with various third-party software packages.

**What kind of pictures would you like to use?**

The texture mapping can be carried out both by using the internal imagery of the scanning sensor as well as using images taken with any kind of external camera. Working with external digital data not only allows for a variety of possibilities of texture capturing but also provides a large degree of freedom with regard to pixel resolution, professional illumination and raw data processing with color management. Furthermore, it is possible to complement the 3D data generated by a monochrome scanning sensor with color imagery, or even to work with multispectral data (UV, IR, etc.).