

## **The “quest” to an optimized 3D visualization of cultural heritage artifacts.**

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The idea behind this presentation was created a few months ago during our work for the project "MAK 3D - Digitalisate, Daten, Display". The project is supported by the Federal Ministry of Art, Culture, Public Service and Sport as part of the “Kulturerbe Digital” funding program. One of the project’s purposes was the in-house 3d documentation of a large number of objects in order to publish them online and offer them to public viewing. For that purpose, a 3D scanner was purchased, Artec Eva, which is also affectionately known as the “iron”. A photorealistic texture as much faithful to the real colors of the object as possible was of high importance and one of the prime targets.

However, certain challenges arised that made us experiment differently with the scanning device and realise that obtaining the desired result was not an easy process. For example, continuous scans around the object produce lower quality texture than short scans which capture only a specific area of the object. However, this affects the post-editing process and the time spent for each artifact, since we have to work with more data captured. Trials where we scanned with the use of grey cards (as reference points) in different light conditions revealed colour discrepancies that we fixed later. Finally, divergences could be noticed on different types of screens and different browsers.

The questions we would like to address via this presentation/short paper touch upon practical issues and are tightly connected to theoretical aspects. What can be achieved with the Artec Eva technology in terms of texture? How can this be achieved and is it

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as easy and fast as we first thought? Which are its strengths and which are its weaknesses? What is the purpose of a 3d model? Who defines the purposes and when is the texture of a 3d model important? ***Why is what we see important? Could we ever perceive the “true colours” of an artifact?***

For the purposes of the presentation we first made a selection of objects from different departments and of different materials. We scanned each one of them by always taking both short scans and longer continuous scans and compared the textures rendered. We examined the different texture export options Artec Studio offers and if and how those affect what we view. We took then the exported texture files to Photoshop and we recalibrated them with a grey card as a reference (every scanning session started with a scan of the object and the grey card next to it). Later, we tweaked the texture (still in the Photoshop environment) to increase its sharpness. During the upload of the 3d model on Sketchfab, extra adjustments were made concerning the application of lights in our scene and the application of extra sharpness; also decisions that alter/correct/change the ending result. Throughout the workflow we tried to be very cautious not to “spoil” our texture but only enhance it by achieving neutrality.

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We will refer shortly also to the hybrid option that Artec technology offers with which we can combine the colorless watertight mesh with photos of the object (3d scanning + photogrammetry). Although, the number of photos to use can be smaller than that of a sole photogrammetry project, there are still certain things to pay attention for a good result (ambient light, white balance). At this point, it is important to stress that all the steps and decisions made were documented (metadata / paradata) in order to facilitate *transparency* and *reproducibility*.

As an epilogue, we would like to bring three observations to the table that deserve special mention. First, the significance of combining 2d and 3d ways of thinking to manage and produce a photorealistic outcome for a 3d model. Therefore, it is important for every practitioner / researcher of every level to engage in a continuous learning path and training. Next to that, we should look at our offered results as a long-term “dowry” and apply the best practices to ensure that (quality, transparency, preservation of raw data). However, parameters like the equipment and time available along with the skillsets of the people involved play a crucial role to



this end. Finally, sharing our results and methodologies and engaging in an open dialogue could only be fruitful and paramount to further progress.

### Useful links:

- [MAK – Museum of Applied Arts, Vienna \(@MAK 3D\) - Sketchfab](#)
- [3D-Scans: MAK-Objekte zum Greifen nahe - MAK Blog](#)
- [Only Online: Das MAK rollt die Teppiche aus! Geknüpft-gewebtes im Web - MAK Blog](#)
- [15 Sammlungs-Outfits für die ersten 3D Supermodels des Digitalen MAK - MAK Blog](#)
- [MAK Blog - MAK Blog](#)

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