



Fraunhofer Innovations for Cultural Heritage, Novel Methods for the Analysis of Materials and Damages in 3D

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Interest in 3D digitization and visualization has steadily increased in the cultural heritage sector over the last years, and 3D technologies are now used for conservation, presentation, and interaction in various ways. 3D models reproduce the geometry, texture, and material properties; in short, they show an object's outside. However, additional data regarding the inside has not been included in 3D models so far. A visual preparation of cultural artifacts with information on their material composition and potentially existing damages has been developed and applied in the Fraunhofer project "Fraunhofer Innovations for Cultural Heritage".

Different modalities like Terahertz-technology, confocal microscopy and ultrasound-tomography were used for complementary material analysis and damage detection. Combined with methods of surface digitization like photogrammetry, stripe light acquisition and endoscopy a consolidated 3d representation (models) of sculptures containing information about their exterior and interior status has been established. Together with the "Staatliche Kunstsammlung Dresden" it has been shown that the methods are mobile so that they can be used directly in the exhibition room or location.

The consolidated 3D models are displayed using a autostereoscopic display. A special web-app has been implemented to interact with these models.

The results of the project will be presented by means of a measurement campaign performed at the sculpture collection of the Albertinum in Dresden.

An outlook will be given for the further development of the technology for its use in urban environment.