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“The Future of Cultural Heritage: 3D Mass Digitization“

Abstract

The museums and collections in the industrialized countries alone host a vast number of cultural heritage artefacts - estimates consistently talk about hundreds of millions. The collections in the Smithonian Institutes, for example, hold approximately 137 million artefacts with a large number of objects being added each year. And according to consistent estimates, 90% of all of the existing artefacts in archives and museums are awaiting 'their discovery'. Finally, as another example, according to the estimates of the British Museum and Archives Council only 50% of the objects held in British Museums is also known to them.

In analogy to the 2D-digitization of classical print material of the past decades 3D-digitization will, in the beginning, mainly focus on the 3D 'back digitization' of collections together with the digital markup and classification and the digital archiving of existing artfacts as well as new collection items.

All this with the obvious benefit of a broad, world-wide and parallel availability (for the interested individual to the expert member in collaborative research teams), the use of 'digital replicas' in hybrid exhibitions (i.e. exhibitions merging real with virtual artefacts), the use of high-resolution 3D models as a replacement for inter-museum loans (to avoid damages, high insurance costs, legal issues of all sorts), and the option for high-fidelity replicas (based on 3D printing).

The 3D-digitization of cultural heritage also bears an enormous market potential: based on the results of one of Europeana's (the European Digital Library) projects (http://www.enumerate.eu/) we can conclude that currently only a mere 1% of Europeana's objects are 3D artefacts which have been 3D digitized.

Of course, 3D digitization, up to now, has been prohibitively time consuming and, thus, too expensive.

Studies by the Victoria and Albert Museums in London carried out together with the world-wide leading labs in this field show that the average time to digitize a 3D artefact ranges between half a day and 2 days, with most of the time spent to manually position the digitization device.

The talk will analyse the challenges which have to be met in order to automate and to industrialize the complete workflow for the 3D digitization of cultural heritage artefacts and will address both, the research results to be delivered as well as the chances for a new technology/service market aiming at a complete, fast, effective, and economic approach for the digitization, classification, annotation, and archiving.

High-end visualization together with high-speed multimedia networks will then warrant a truly world-wide and distributed access to all of our cultural heritage.

Curriculum Vitae

Dieter W. Fellner is professor of computer science at TU Darmstadt, Germany and Director of the Fraunhofer Institute of Computer Graphics (IGD) at the same location. He is also professor at TU Graz, Austria, were he established the Institute of Computer Graphics and Knowledge Visualization.

His research activities over the last years covered efficient rendering and visualization algorithms, generative and reconstructive modeling, virtual and augmented reality, graphical aspects of internet-based multimedia information systems, cultural heritage and digital libraries.