MUSICAL INSTRUMENT COMPUTED TOMOGRAPHY EXAMINATION STANDARD: THE FINAL REPORT OF THE MUSICES-PROJECT

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INTRODUCTION

Digitalization of cultural heritage as a field of research becomes increasingly important. Within the project MUSICES, the Germanisches Nationalmuseum (GNM) and the Fraunhofer Development Center for X-ray Technology (EZRT) developed a guideline for three-dimensional X-ray Computed Tomography (3D-CT) of musical instruments. The work packages include development of checklists, recommendations for handling and transport as well as means and measures for image quality assurance.

EXAMINATION STANDARD: THE FINAL REPORT

More than 80 historically remarkable objects in the collection of the GNM were digitized. Additionally two dozens of musical instruments were provided by partner organizations, i.e. Staatliches Institut für Musikforschung Preußischer Kulturbesitz, Berlin, the Ethnological Museum in Berlin, and the Museum für Musical Instruments at Leipzig University.

A REPRESENTATIVE SELECTION OF HISTORICAL RELEVANT INSTRUMENTS

CT measurement principle and parameters to be set appropriately.

APPLICATIONS AND RECOMMENDATIONS

The resulting recommendations enable researchers and technicians at different facilities to produce comparable CT measurements for various stake holders (public or private). Thereby, the CT-measurement is seen as a first step to a large scale fully 3-D digitization of objects of cultural and/or historical importance in general.

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OPTIMIZATION BY MODELLING

In order to optimize positioning and orientation of brass instruments with respect to the flat panel detector an entropy-based procedure was applied, using simulated X-ray data sets.

PREPARATION OF THE CT EXAMINATIONS

The CT inspection of a precious instrument must be thoroughly planned and prepared. Fixing each valuable object inside an X-ray cabinet for up to 24 hours is necessary to minimize vibrations, mechanical shocks and percussions. Climatic changes must stay within the tolerances for humidity and temperature.

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A meta-data format comprehensively describing the measurement procedure was specified. Optimized measurement protocols, case studies, check lists and a guideline for transport and handling of historical objects are part of the resulting best practice guide: