

MEDIEVAL MICROFABRICATION: X-RAY TOMOGRAPHIC AND LAMINOGRAPHIC VISUALIZATION OF RELIGIOUS ARTWORK

Joris Dik (1), Arie Wallert (2), Jorik Blaas (1), Peter Reischig (1,2,3), Lukas Helfen (3), Alberto Bravin (3)

(1) Delft University of Technology, the Netherlands, j.dik@tudelft.nl, * presenting author

(2) Rijksmuseum, Amsterdam, The Netherlands

(3) European Synchrotron Radiation Facility (ESRF), Grenoble, France

During the late Middle Ages religion was experienced in a highly personal, intimate manner. The Christian worshipper tried to empathize with Christ by privately meditating on his sufferings. All kinds of miniaturized attributes, usually with depictions of Christ's passion, were used as support during prayer and meditation. We studied two of such intricate objects with Synchrotron-based imaging methods, aiming to understand their method of production. The first example is an early 16th c. prayer nut from the collection of the Rijksmuseum (Amsterdam). This spherical wooden object measures 4cm in diameter and consists of two hemispheres connected with a hinge. The interior of the nut holds wood carvings with scenes from the life of Christ. These miniature carvings have been made with extraordinary detail that goes well below the millimeter scale. We will show how synchrotron-based computed xray tomography revealed the making of this piece of medieval *microfabrication*. The presentation will include both digital and physical models of the prayer nut and its composing elements, using 3d computer rendering as well as scaled, 3d printed replication.



Figure 1) One hemisphere of the prayer nut, showing miniature woodcarving of the crucifixion.

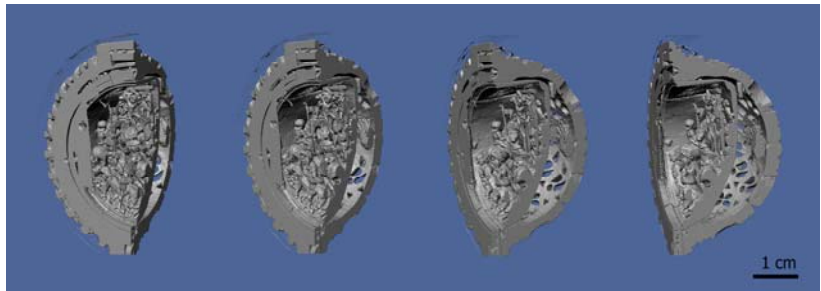


Figure 2) 3d animation of a vertical cut

The second case concerns the Norfolk Triptych, an early 15th century altarpiece from the Museum Boymans-van Beuningen in Rotterdam. The central panel shows the deposition of Christ. Behind this paint layer, a small wooden inlay has been placed into the panel, as was revealed with conventional x-ray radiography. It has therefore been suggested that some sort of relic, a piece of paper or textile, has been worked into the altarpiece. This would obviously have greatly increased the religious value of the painting. However, a flat, organic piece of material, sandwiched between oak wood and heavy metal paint will be completely transparent in regular x-ray imaging. We have therefore made a dummy of the altarpiece, including a hidden relic. We will show how synchrotron-based computed laminography with propagation-based phase contrast capability has been employed successfully in this visualization challenge.