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Digital Rubbings:

Monitoring Bookbindings with the Portable Mini-Dome (RICH)

The RICH project (Reflectance Imaging for Cultural Heritage, KU Leuven, 2012–2015) is creating a digital imaging tool for researching, studying, and exploring material characteristics of library materials produced in medieval and early modern times. In 2005 the module was created for reading cuneiform tablets in the department of Assyriology of the University of Leuven (KU Leuven). With the second generation of the imaging devise, the visualization of bookbinding stamps (gold- and blind tooled, on the back and on the boards of bindings) creates a sharp and exact image of the tooled surface, a 'digital rubbing' with the possibility to read, measure, compare and identify occasionally difficult accessible decorations on book covers.

The digital imaging device, IMROD (Imaging Module for Multi-spectral, Reflectance or 2D+) is digitizing with omni-imulti-directional lighting and export the result to 2D+. The technique is based on polynomial texture mapping, also known as Reflectance Transformation Imaging (RTI), a technique of imaging and interactively displaying objects under varying lighting conditions to reveal surface phenomena. With RICH the decorative and technical characteristics of manuscripts, paper and bookbindings are documented. The module is a hemi-spherical structure with a single downward looking video camera (28 million pixels). The object to be captured (maximum 180 to 120 mm) lies in the center and is illuminated from computer-controllable lighting directions, through the subsequent activation of multiple white LEDs. The different angles that illuminate the surface of the artifacts are revealing extreme details. Special attention is taken to produce raking light, the illumination at an oblique angle or almost parallel to the surface, to provides information on the surface topography of the book or page. For each illumination an image is taken by the overhead camera, in total 260 images for each object. After processing these 260 images, filters in de visualization system are incorporated in the software. Fine details can be highlighted by the use of specific digital filters, bringing out structures that would not be visible under single illumination (like shade, contrast, sharpening and sketch filters). By scaling the image, a measuring tool in the software defines the dimension of the stamp and print lines unto 10 micron.

To develop the possibilities for 'digital rubbings', in 2013 a group of medieval and early modern bindings (11th to 17th century) were examined in Flemish Heritage collections (the Museum Plantin-Moretus and Leuven University Libraries). The lecture will discuss observations captured by the visualization system, the development of the database with the online viewer, and the possibilities of 'RICH' as a research tool in the art technical—and in the conservation field.

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