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FROM RECTIFIED IMAGES TO ORTHOIMAGES – HOW TO FIND THE APPROPRIATE METHOD FOR THE DOCUMENTATION OF STRUCTURED FACADES

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Photogrammetric single image methods, like the generation of rectified images and orthoimages are well suited for mapping and planning purposes in architecture and monument conservation. The documentation of roughly planar façades with the help of rectified images is a well known and fully developed technique. It combines true scale geometric measurements with full image information under relative inexpensive production costs. But in case of more structured building surfaces, rectified images involve accuracy problems as a result of the depth depending radial offset.

To avoid this problem, a surface model of the façade has to be acquired and used for the production of an orthoimage. 3D-Laser Scanning is a well suited technology for the acquisition of the façade surface model. But in several cases, this technique is not available on-site or it is too expensive for a small project. In this situation, the measurement of horizontal and vertical profiles offers the possibility to produce an image map with orthoprojected images for each façade plane, which is defined by the profiles. With special control software for a motorized reflectorless tachymeter it is possible to measure different profiles nearly fully automated and use them for orthoimage production.

We present results of façade measurements with all three methods: Image rectification, orthoimage based on profile measurement with the newly developed software Archimedes3D/FaMes and orthoimage based on 3D-Laser Scanning with the 3D-LS (Laser Scanner of the Institute for Navigation, University of Stuttgart). The investigations contain an accuracy analysis. Advantages and disadvantages will be discussed. As a test site we have chosen the great masonry test specimen at the Federal Institute for Materials Research and Testing (BAM), which was constructed with historic building materials (several brick types, natural and sand stone) and which features a structured surface with different planes.