Geospatial Modeling & Visualization

A Method Store for Advanced Survey and Modeling Technologies

GMV   Geophysics   GPS   Modeling   Digital Photogrammetry   **3D Scanning**   Equipment   Data and Projects by Region

Breuckmann HE

Metadata Forms | **Setup Operations**

In July 2010 the Center acquired a Breuckmann smartSCAN HE 5 MegaPixel Color system. This is a fringe projection, close-range, 3d digitizing system. The system works by projecting a patterned light across the object and uses two cameras to very precisely calculate the locations. Different lenses permit variable sizes of objects and levels of detail to be recorded. The system simultaneously records RGB data. The Center currently has three lens systems: M-125 (100-75 mm FOV and 60 mm measuring depth), M-475 (380-285 mm FOV and 235 mm) and a M-825 (660-495 mm FOV and 410 mm measuring depth). Additional lenses up to 1200 mm are available. Example performance specifications of the M-125 configuration are an X, Y resolution of 40 micrometers, resolution limit (z) 2 micrometers with +/- 5 micrometers noise in Z and a feature accuracy of +/- 9 micrometers. As is the case with all scanning, when multiple scans are merged to create a "complete" 3D digital object, the final aggregated output specifications are less than the individual scan specifications. Nonetheless this scanner provides exceptional detail for object work. The system also includes a calibrated rotating table which can be used to quickly acquire scans and merge them. The system also includes a set of calibration panels that allow on-site recalibration of the scanner system.
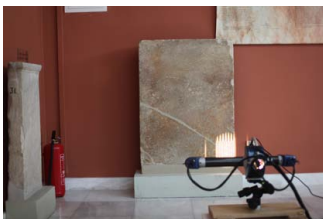
Physically the system is similar to a professional camera set-up with the scanner unit mounted on a commercial-quality photo tripod. Fluorescent lights specifically selected to be compatible with the system illuminate the object to provide a uniformly lit background. Data processing then starts with the provided OptoCat software which provides a wide range of tools for initial acquisition and processing, including merging scans and interfacing with the automatic rotating table. For objects that are too large for the table or for those which have complex surfaces, the objects must be manually repositioned so that all areas are covered by scans. For larger objects, the scanner must be physically repositioned. Scans may require additional processing beyond that provided in the OPTOCAT software. For this purpose the Center has multiple licenses of RapidForm XOR and Innovemetric's PolyWorks software. More details on the unit, as provided by the manufacturer, can be found here.

The systems has already been utilized in a number of projects including the scanning of epigraphic materials at the University of Mississippi Museum (Oxford Mississippi) and at the Epigraphik Mouseio in Athens (especially the Drakon Stele) as shown in the pictures on this page. The system has also been used in an innovative analysis of rock art at the Chaco Canyon World Heritage site.

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