

HIGH RESOLUTION DIGITAL PHOTOGRAMMETRY WITH OBJECT SURFACE TEXTURE

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Digital Photogrammetry when coupled with multi-image capture can provide high resolution imagery with detailed surface texture. Surface texture can be in greater detail than traditional point cloud laser scanning, and the camera is not required to be in a fixed location allowing greater flexibility in capturing raw data.

Existing building documentation or other large objects are example cases where it can be difficult or impossible to document due to lack of access. Often owner and architects resort to repelling or other means of surveying an object. Digital Photogrammetry can be obtained remotely obtained controlling a camera as it moves across an object while the camera and rigging supported by the object itself e.g. swing lift, without the need to put human in place.

We will discuss the use of robotic equipment originally developed for aircraft skin diagnostics has been modified to allow for use at an appropriate distance from a façade to capture detailed imagery. Large composite images are created from the detailed close-range images. These comprehensive composites allow for wide-area pan and zoom inspection of the façade by all project stakeholders viewing safely online as if they were right there.

Presenting high quality information in a usable format is the key to guiding a successful project. In this session we will describe how 21st century photogrammetry coupled with web based technology was used to document and guide an 1896 church masonry restoration project. This design delivery method resulted in more project control, reduced equipment and manpower effort during the investigation phase, and will provide the next generation of preservationists and owners a readily accessible record on which to base future projects.

How photogrammetric imagery was used to produce blueprint substitutes with full surface stone texture will be demonstrated in this presentation. These blueprint substitutes enhance productivity, development of work scope, and project management. High resolution photo inspections viewed interactively side-by-side online with these blueprint substitutes were used to assist in RFP development and bidder review of the project.

We will demonstrate how the documentation tools allowed for remote, close-up assessment of the stone and other surface features on a scaled rendering. The web based display facilitates interactive use, and “on-image” recording of forensic investigation data e.g. drill resistance testing, ground penetrating radar, impact echo and ultrasonic graphs and data, for before and after restoration comparisons. How the technology makes work scope and forensic data retrievable, accessible, and understandable to the field user will be illustrated. Photogrammetric scaled photo-renderings with enhanced surface texture as blueprint substitutes and high resolution photo

inspection tool allowing pan and zoom capability will be demonstrated to show how greater control can be established for projects, and reduce bidder uncertainty.

These tools ultimately allow for the evaluation and documentation of the conditions of stone and other object surfaces not possible until current development in computing and the internet.

Examples can be seen at <http://manassasconsulting.com>

Bio

Battle Brown created the patent-pending PhotoDrawing™ image rendering and PhotoSurvey inspection tool process to provide detailed high surface texture scaled drawings to the architecture, engineering, and construction industry for existing buildings, structures, and objects. He has over 35 years experience in imaging, graphics, and communications, software and has been involved in the AEC industry for over a decade as owner, contractor, and consultant. He is a Senior Research Scientist at Carnegie Mellon in addition to being a serial entrepreneur.