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directed by
Jean CLOTTE

PLEISTOCENE ART OF THE WORLD

Short articles



USING SUPER-HIGH RESOLUTION PANORAMAS (GIGAPANS) TO DOCUMENT AND STUDY ROCK ART PANELS

Robert MARK, Evelyn BILLO

Panoramic photography began in the middle of the nineteenth century. Images were ‘stitched’ in the darkroom. It wasn’t until the late twentieth century that Apple Computer Corporation provided a practical approach to digitally stitching images (QuickTime Virtual Reality, QTVR). This required very careful photography, and then describing the relations between images in an arcane script. The projection was limited to a cylinder. It was shortly thereafter that we started using panoramas to document rock art panels. We experimented with both panoramas (photographed from one point) and mosaics from multiple points. Because automatic stitching software programs are designed to stitch panoramas, stitching mosaics can be quite difficult.



Gigapan
at Sears Point

274 Megapixel
25,785 by 10,664 image,
stitch from an array of 12
by 7 telephoto images.



Array of images in the Gigapan stitcher, prior to stitching. A full rectangular array is required. This is a very small example; arrays of several hundred images are possible. Also shown are the robotic pan head and the stitched example.

Advances in both hardware and software came quickly. Early major software advances included stitchers that permitted graphically placing images, and supported spherical and other projections. Hardware advances included panheads which permitted rotation in precise increments about two axes. Additional improvements in stitching and blending algorithms permitted more flexibility in photography, and now many panoramas are generated from handheld photographs. Modern stitchers will automatically position the images, in most cases, without user intervention. For a comparison of the many stitchers now available, see http://en.wikipedia.org/wiki/Comparison_of_photo_stitching_applications.

The most recent advance is super high-resolution Gigapan panoramas (<http://en.wikipedia.org/wiki/Gigapan>), which permit zooming in to see minute details of elements within a larger panel. This is made possible by the use of a robotic panhead, which is programmed to take a rectangular array of hundreds of overlapping telephoto images. Since their relative positions are known, stitching with the Gigapan stitcher is efficient (figure). Gigapan panoramas can be viewed with a graphics program, such as Photoshop, or with a browser on the Gigapan website or with Zoomify. Links to these and other Gigapan rock art panoramas can be found at <http://www.rupestrian.com/> or http://www.gigapan.org/gigapans/most_recent/?q=rmark. Be sure to select “Launch Full Screen Viewer” and allow time for screen update when zooming in.

Conclusion

Panoramas and mosaics are very useful in the documentation of rock art panels. Printed panoramas can be taken into the field for annotation and the marking of sample locations, such as pXRF (portable x-ray fluorescence) measurements. The Gigapan process provides not only systematic overlapping photographs of large areas of interest such as an entire panel, but also provides a single image with full resolution of details for digital annotation and analysis in the office.





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