Virtual Reconstruction of Vases using Active Optical 3-D Imaging

Janis Mandrus, Guy Godin
National Research Council of Canada

The emergence of 3-D imaging techniques provides a new tool for the study and conservation of fragmented artifacts. By providing a digital representation of the shape and color of each fragment, these techniques allow the scholar to perform a number of tasks including virtual manipulation and reconstruction of the object. Automated tasks useful to the archaeologist, such as fragment classification and matching, having also been proposed. Fragments belonging to two ancient Greek vases from the Diniacopoulos collection were scanned for purposes of virtual reconstruction using the 3-D laser imaging system developed by the Visual Information Technology Group of the National Research Council of Canada (NRC). The vases, a black-figured pelike and a black-figured skyphos, had undergone previous restoration leaving them with large amounts of shellac adhesive at the break edges, plaster fills, and misaligned joins. As part of a pilot research project carried out in conjunction with the NRC, the vases were virtually reassembled using available software tools. The study examined the capabilities of the technology to successfully achieve a virtual reconstruction of the vases from the scanned fragments. The technology was also evaluated in terms of its use as an aid to the conservator, for example in planning the physical reconstruction of the vase. This paper will present the study undertaken at the NRC and describe the technology used to create the virtual images. Current research on 3-D imaging technology as applied to the fields of art history, archaeology, and education will also be discussed.