

VITA: Visual Interaction Tool for Archaeology (Demo)

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ABSTRACT

VITA (Visual Interaction Tool for Archaeology) is an experimental collaborative mixed reality system for offsite visualization of an archaeological dig. Our demonstration of VITA allows multiple users to visualize the dig site in a mixed reality environment in which tracked, see-through, head-worn displays are combined with a multi-user, multi-touch, projected table surface, a large screen display, and tracked hand-held displays. VITA augments existing archaeological analysis methods with new ways to organize, visualize, and combine the standard 2D information available from an excavation (drawings, pictures, and notes) with textured, laser range-scanned 3D models of objects and the site itself. Users can combine speech, touch, and 3D hand gestures to interact multimodally with the environment.

Categories and Subject Descriptors: H.5.1 [Information Interfaces and Presentation]: Multimedia Information Systems—Artificial, augmented, and virtual realities; H.5.2 [Information Interfaces and Presentation]: User Interfaces—Graphical user interfaces (GUI), Interaction styles

General Terms: Human Factors.

Keywords: Mixed Reality, Collaborative Environments, Multimodal Interaction.

1. SYSTEM OVERVIEW

This demo presents VITA [3], a collaborative mixed reality system that allows users, ranging from interested novices to experienced archaeologists, to visualize and explore an archaeological excavation off-site. Working with colleagues in anthropology and computer science, we collected multimedia data from an ongoing Stanford University archaeological excavation at Monte Polizzo in western Sicily [1]. In VITA, we combine standard archaeological recorded data, which is mostly 2D in nature (drawings, pictures, and notes), with a variety of newly acquired data (a 3D site model created from laser range scans and registered digital images [2], 3D models of small finds, panoramas, video, and ambient audio), all of which is made available in a seamless collaborative environment, as shown in Figure 1.

Two users can navigate this multimedia environment through multimodal interaction that combines speech, touch, and 3D hand gestures. VITA was originally designed for archaeologists or archaeological students who have at least basic knowledge of the

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Figure 1. Two users collaborate in VITA. While one user inspects the 3D virtual model of the ceramic vessel above the table, comparing it with the high resolution image on the screen, the second user looks at the 3D miniature terrain model next to the table. (Captured live, using a tracked video-see-through display.)

excavation process; however we believe that the user interface is sufficiently easy to understand that it will be possible to demo the system to a much wider audience.

2. ADDITIONAL INFORMATION

A brief video (DivX encoded) is available for download from <http://www.cs.columbia.edu/graphics/projects/vita>.

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REFERENCES

- [1] P. Allen, S. Feiner, L. Meskill, K. Ross, A. Troccoli, B. Smith, H. Benko, E. Ishak, and J. Conlon. Digitally modeling, visualizing and preserving archaeological sites. *Proc. JCDL 2004 (Joint Conf. on Digital Libraries)*, Tucson, AZ, June 7–11, 2004, 389.
- [2] P. Allen, S. Feiner, A. Troccoli, H. Benko, E. Ishak, and B. Smith. Seeing into the past: Creating a 3D modeling pipeline for archaeological visualization. To appear in *Proc. 3DPVT 2004 (3D Data Processing, Visualization & Transmission)*, Thessaloniki, Greece, September 6–9, 2004.
- [3] H. Benko, E. Ishak, and S. Feiner. Collaborative mixed reality visualization of an archaeological excavation. To appear in *Proc. ISMAR 2004 (IEEE and ACM Int. Symp. on Mixed and Augmented Reality)*, Arlington, VA, November 2–5, 2004.