

# Representing, exchanging, and assessing ideas in an *almost* natural way: The Traces digital media annotation systems

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## Introduction

In this Interactive Session, we will demonstrate how two related digital media annotations systems can be used to support learning and the exchange of ideas. The Traces systems enable users to make a new form of representation called a *trace* and to place these traces in an conversationally-structured interface for subsequent response by other users. A trace is composed of any visual media and an annotation layer composed of speaking and pointing. The traces systems can be used for a variety of learning purposes, including self-reflection, peer-to-peer interaction, more intelligent assessment, and distributed collaboration.

## Proposed plan for the session

In our session we would:

- Demonstrate how traces are made in the system and how they are replied to within a conversationally-structured interface.
- Provide opportunities for audience members to make traces during the session. We will argue that because of the character of traces as representations, they offer to people a more natural way of representing ideas and practices than in many prior technology-based systems.
- Display traces that have been made in a wide range of settings, including architecture, teacher education, museum visits, dance education, and intercollegiate rowing.
- Engage the audience in a discussion of the wide general use of these systems, based on the display of traces from these diverse settings.
- Engage the audience in a discussion of the various sorts of learning activities that the systems support, including peer-to-peer interaction and assessment of learners by teachers/masters. We will describe learning environments and scenarios in which the systems have been used as well as a number of other possible ways the systems can be used to support learning.
- Discuss the theoretical underpinnings of the system, which come from studies of naturally-occurring human interaction and representational practices (e.g. Stevens & Hall, 1998).

By showing both the technical aspects of the system and its current and envisioned pedagogical uses, audience members should have a basis for determining the value of these systems for their own uses.

## Technical Description of the Traces Systems

The two systems (called VideoTraces and ArtTraces) are designed to work with video images and with still images, respectively. The basic formula by which traces are composed is the same in each system: Base + Annotation = Trace. The base is an image, either still or moving that the user chooses or makes to comment on. The annotation is the commentary in the form of recorded speech and pointing gestures (Figure 1). Pointing gestures are recorded as the mouse is moved over the image. (The ability to record the trajectory of pointing gestures, made by mousing over the image, is also an important part of the system; studies of

people using language in a wide variety of contexts recurrently highlight that the ordinary resource of pointing ties verbal language to the physical context in a way that makes both utterance and visible action intelligible.) The trace is composed automatically and saved by layering the annotation over the base.



Figure 1. This is annotation recording screen in the VideoTraces system. Users are taken automatically to this screen after recording or selecting a video. The annotation recording screen for ArtTraces is similar.

With VideoTraces users can record a new piece of video or can use as a base an existing piece of video, such as video recorded by another visitor or video introduced by museum personnel. VideoTraces works with a standard digital video camera and a standard cable that connects the computer to camera. With ArtTraces the images are already loaded into the computer so neither a camera nor the cord is required. Users simply choose a base image from a list and then record their annotation over it. (Figure 2a). Once traces are made, they are represented within a threaded discussion like interface (Figure 2b). Users can make a trace that begins a new thread or they can make a trace that responds to one made by someone else.

Figure 2a & 2b. Figure 2a shows the first screen that users see in ArtTraces. If they click on “View Others” they are taken to a screen very similar to the First VideoTraces screen displayed in Figure 2b.

In making traces, users can take advantage of some simple but useful features that transform the base image. In the VideoTraces system for example, users can play their video recording back in slow motion and record their annotation over that. What will be saved is the annotation over the slowed video. This feature affords examining and representing the phenomenon from a different perspective and on a different timescale than possible in real time. In ArtTraces, visitors can zoom in on a particular figure or region of a picture. What will be saved is the annotation over the successively zoomed in picture. This allows the trace

maker to focus the viewer's attention on just the feature of the picture that she is highlighting in her spoken annotation.

## References

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