

# DALI: Bring Multi-touch Interaction to Painting Artwork Appreciation

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**Abstract:** We present DALI (Dali's Artwork for Learning Interactively), a system which brings multi-touch interaction to painting artwork appreciation. Spanish artist Salvador Dalí's paintings are digitally deconstructed and shown on a multi-touch tabletop, with appropriate visual effects triggered by gestures, which guides students to explore and feel the artwork interactively. Thus it would be an effective improvement in visual arts education.

## Introduction

Although art appreciation is a natural-born intuitive ability of human, learning is still required in order to get a deeper level of impression and comprehension. Under appropriate guidance, people's primitive sensitivity and acceptance of beauty will be extended, helping them to enjoy artistic works and understand them thoroughly and systematically.

Some modern artists use various computer technologies to recreate classical artistic works to make them interactable (eg. Talking Mona Lisa, 2009). On the other hand, multi-touch is a suitable and natural interaction technique for presenting arts, especially for paintings. However, most related works were showing artworks as non-interactable images or focused on artwork creation (eg. Vandoren, P. et al., 2008).

We present DALI (Dali's Artwork for Learning Interactively), which enables multi-touch interaction with Spanish artist Salvador Dalí's paintings. 30 Dalí's masterpieces are digitally deconstructed and each component is associated with appropriate visual effects, which are triggered by natural gestures. Dalí is one representative Surrealist; by adding multi-touch interactive effects, we could show the surreal, mystical, magical aura of his paintings in a vivid and attractive way. Thus it would be an effective improvement in visual arts education.

## DALI System

### System Architecture

The DALI system (see Figure 1) is running on uTable, a rear Diffused Illumination multi-touch tabletop system (100cm\*75cm\*75cm, 1024\*768 for each unit, which can be seamlessly combined into a larger one) developed by our lab. uTouchHub is an image processing module based on CCV project (<http://ccv.nuigroup.com/>), which extracts blobs from different cameras' raw image (two cameras for each unit), fuses and maps the results to the integrated surface, and sends them to uGesture using TUIO protocol (<http://tuio.org/>). uGesture is a plug-in based multi-touch gesture recognition engine, which translates touch actions into semantic-level gestures. The user interface shares its layout information with uGesture and subscribes to needed gesture events. The user interface, which is written in Adobe Flash, handles interaction logic as well as rendering visual effects.

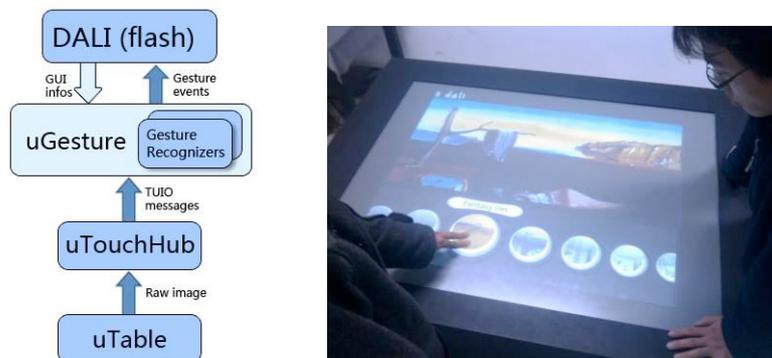


Figure 1. DALI system: (Left) System architecture; (Right) Two students browsing the gallery

### Interaction Details

In Gallery view (see Figure 1), the paintings are shown in a cycling thumbnail list, which will slide to the left/right when dragging or flinging. Thumbnails under users' fingers will be shown in fish-eye style, and give

users an animated sneak peek as well as text introduction. Tap a thumbnail to view and interact with the painting in full-screen.

When an artwork is shown on the tabletop, users can not only view the piece on the large display surface, but also interact with it. Each painting contains several types of interaction that related to its subject. There are no visual hints telling which parts are interactive, so that it gives users freedom to explore and find each of the hidden surprises themselves. Take two artworks for example:

The *Raphaelesque Head Exploding* (see Figure 2) presents a more intense explosion effect under users' touches, trying to give them much stronger impression and deeper understanding than a simple static image.

The *Singularities* (see Figure 2) has more interactions: a bird (A) flies out when the arm of the figure is touched; the light (B) goes out and the root on the left of the sofa (C) retracts when touching the light; the clock in the upper left corner (D) also reacts to users' actions. All these arrangements suggest an even stranger atmosphere of the painting.



Figure 2. Interacting effects: (Left) *Raphaelesque Head Exploding*; (Right) *Singularities*

### Improvements in Visual Arts Education

1. Change the way of looking at paintings: "Touch is Forbidden" in traditional museums; audiences are kept at a distance. DALI encourages them to observe, touch, explore, experiment with exhibits, helps them feel the exhibits, and gives them inspiration.
2. Emphasize the theme: Sometimes audiences need to be guided to understand the author's intention. By deconstructing the visual symbols and re-presenting them expressively, we can point out the right direction for them to observe and imagine. The combination of imagination and visual effects will deepen the impression and understanding of the original paintings.
3. Encourage active learning: The form of combining multi-touch with artistic works will help to attract the attention of students, arouse their enthusiasm, and induce them to be emotionally involved.
4. Learning Collaboratively: Multi-touch tabletop enables students to interact with a painting at the same time, meanwhile gives them the opportunity to communicate and discussion more thoroughly. They will be more efficient in thinking and exploring, and have more fun in a group.
5. Compensate the "aura" of the work: In "The Work of Art in the Age of Mechanical Reproduction" Benjamin wrote: "Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be. This unique existence of the work of art determined the history to which it was subject throughout the time of its existence." Artwork loses its "aura" when viewed in picture album or on screen. However, what DALI shows is the recreation of the original work accomplished by painter and audience together, which retains the aesthetic pleasure brought by "aura" to a certain extent.

### **References**

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