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ELECTRONIC PAINTING A PROPOSED NEW FINE ART MEDIUM

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ELECTRONIC PAINTING - A PROPOSED NEW FINE ART MEDIUM*

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Electronic painting is a proposed new art medium in which the artist literally paints pictures with electrons rather than with pigments, viewing his work as it is being created on a color television screen. This new medium is expected to have major applications in the following fields of art: (a) creative and experimental art, (b) art education, (c) commercial art, (d) amateur art, and (e) art appreciation and enjoyment.

This presentation consists of two parts: (1) the concept of electronic painting; and (2) simple demonstrations of the electronic painting concept. Electronic painting systems of the sort to be discussed have yet to be built. Previous work by Kubitz and Poppelbaum¹ at the University of Illinois has shown the power of electronic techniques in color cartography. We propose that electronic painting be further developed as a high quality art medium with all of the features needed for the creation of outstanding works of art.

The Concept

In electronic painting a color television set is the artist's canvas and paint, a penlight is his brush. The penlight is pointed towards a television camera, producing a cursor spot on the TV screen. When the artist presses a button, an image of the cursor is recorded on the screen as he moves the penlight about. Lines or areas are formed depending on the movement of the penlight.

The image being created is stored in an electronic memory which links the camera with the television set. Much as with paints, the artist works with one color at a time and the recorded image appears on the TV screen in a selected color. As the artist paints he works on top of previously completed picture details. What he is painting is stored in a scratchpad memory. When he is satisfied, he transfers his new work to the main memory. The penlight can be selectively used to paint or erase, depending on the setting of a switch. Again his actions are recorded in the scratchpad memory until completed (say, for a particular color).

*Summary of technical presentation and exhibit at the 1972 International Convention and Exposition, Science/Technology Center, Institute of Electrical and Electronic Engineers, New York Coliseum, March 20-23, 1972.

The color of the brush marks is determined by settings of hue, saturation, and brightness dials, much like those on a color TV set. In addition, the texture of those marks is controlled electronically. The artist can preset the desired color and texture before painting, or he can paint first and make the adjustments later by experimenting with the controls as much as he pleases. He can add or subtract from the painting, using the penlight as a brush or as an eraser. When he is satisfied with the changes or additions he has made, he presses a button to transfer the scratchpad image into the main memory. This clears the scratchpad memory for storage of the next color component of the picture. The scratchpad is used repeatedly in the electronic painting of a picture, much as an artist changes the color of the paint on his brush.

A completed electronic painting can be preserved either electronically or photographically. It can be redisplayed on a color television set from main memory or a recording. Color slides or prints can be prepared from photographs of the televised image.

Electronic painting (a manual art form) can be combined with computer art (an automated art form), utilizing many special electronic effects. These include electronic zoom, background superposition, color matrixing, and superposition of picture elements from storage. Table I presents a partial listing of achievable effects and features in electronic painting.

TABLE I
Achievable Effects and Features in Electronic Painting

- Painting at a distance ("stepping back while painting")
- Lack of dependence on ambient light
- Painting with light rather than with pigment
- Complete variability of size and shape of brush
- Absolute and fine control over color being applied
- Electronic texturing of the color being applied
- Control of color and texture after brush stroke is made
- Absolute control or erasure without smudging
- No process delays (e. g. , time for mixing or drying of pigments)
- Electronic overpainting (as with opaque paint)
- Electronic layer painting (as with translucent paint washes)
- Electronic "air brushing" effects
- Separately stored painting outline, displayed only when needed
- Electronic "zoom" for closeup painting on an enlarged scale
- Incorporation of picture elements from storage on slides or prints
- Electronic masking or cropping of pictures or elements
- Manual creation of color stereographic paintings
- Capability to go back to previous step (recall from storage)

The Demonstrations

We have prepared two simple demonstrations to illustrate the concept of electronic painting. In the first demonstration we show a series of works of art on a television screen. These are televised images of color slides. Some slides will be shown in their natural colors to illustrate the effectiveness of television display. One can suppose that with proper equipment quite similar kinds of images could be created by electronic painting techniques. Other slides will illustrate how we can modify the moods and ideas expressed in a painting by varying the intensities of the primary colors. The television set has been modified to extend the range of color adjustment, accomplished with a special color control box in front of the TV set.

The second demonstration is a simplified electronic painting experiment. The equipment consists of the color television set with the slide scanner, a black-and-white television camera, a scratchpad memory (image storage tube), and a penlight. The penlight image appears on the red channel of the TV set, the scratchpad memory read-out on the blue channel, and the slide scanner output on the green channel.

A negative transparency of a simple line drawing is inserted in the slide scanner to provide a green outline of a picture on a black background. The operator draws by moving the penlight in front of the TV camera, and a red cursor shows the size and location of the penlight relative to the outline. He then presses a button to paint as he moves the penlight in painting motions. The painted area appears in solid blue. The blue image can be modified by electronic zooming to change its size or location on the TV screen. A second button is pressed to erase the scratchpad memory.

Acknowledgment

The color slides of works of art used in the demonstrations were from the extensive collection of the Slide Library, School of Art and Architecture, Pratt Institute. We thank the Pratt Institute for the loan of these slides.

References

1. W. J. Kubitz and W. J. Poppelbaum, "The Tricolor Cartograph, A Display System with Automatic Coloring Capabilities," Information Display, November/December 1969.

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