Introduction

We propose a new type of software-toy, called "Hyper-Paint", that combines the use of blocks and drawing in order to investigate the possibility of realizing a software-toy that offers the advantages of a computer for creating expressions that are difficult to create in the real world (Figure 1).

While block toys, such as LEGO, and drawing toys are well-known traditional children's toys, expressions of such toys by computer and software techniques have only recently appeared [1-4]. We proposed Hyper-Paint that combines a block toy and a drawing toy, that expression is hard in the real world. Using Hyper-Paint, the user can create 3D objects consisting of blocks that can then be pasted into a diorama box (large box representing the surroundings), both of which can be colored. This poster describe the features of Hyper-Paint and discuss the software from a design viewpoint.

Feature

1. Adding block:
The user can create 3D objects by stacking blocks. The user adds blocks by clicking the previously placed blocks or the diorama box (Figure 2).

2. Painting:
The user can draw to the blocks and the diorama box toward the screen directly in Hyper-Paint. Since the paint appears only on the side that the user can see, which is similar to actual spray painting (Figure 3).

3. Easy operation:
An operation the user need is only a moving mouse and a clicking mouse left button. The user don’t need to change parameters.

4. Quick printing:
Children will want to show an image that they create as soon as they finish a work. The user can print an image displayed on the canvas by pressing a print icon.

Evaluation

When Hyper-Paint was used by men and women of various ages (Figure 4), we found that some experience was required in order to create the desired shape. However, the users appeared to be surprised and interested by the concept of what were, at first, assumed to be 2D line drawings turning out to be rendered in 3D. In addition, we can see the following applications.

Applications

1. Creating Shadow:
After the user paints to all objects with a black pen, he paints to the canvas with a white pen from a fixed viewpoint. Then, the shadow is created behind the shape (Figure 5).

2. Stencil:
The user creates patterns by arranging blocks along the diorama box, and he paints to the diorama box with the blocks. Then, a stencil effect is appeared by removing the blocks (Figure 6).

3. Devising Picture:
The user creates floating blocks by deleting blocks touching the ground. Next, he draws a shadow image to seem to touch the ground from a fixed point. At first, We regard it as the shadow of the blocks, however, we recognize the picture of shadow by rotating the scene (Figure 7).

4. Hiding Picture:
Blocks are put on a picture the user has drawn. Do the others find it (Figure 8)?

Conclusion

The Hyper-Paint appears to offer new vantage points for creating drawings, as well as opportunities for discovery. Later, we will objectively verify the utility of the Hyper-Paint. Although real toys are intuitive and easy to understand, these advantages should be balanced against increased opportunity for discovery offered by the software-toy.

Future work

In the future, we hope to introduce a function to knock down blocks, simulating that in the real world, intuitive save and load functions, a variety of colors and block shapes, and a function that allows users to collaborate over the internet.

References


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Figure 1. Hyper-Paint
Figure 2. Adding block
Figure 3. Patenting
Figure 4. Playing Hyper-Paint
Figure 5. Creating Shadow
Figure 6. Stencil
Figure 7. Devising Picture
Figure 8. Hiding image