Shadowgraph II: an Presentation Interface using a Multi-touch Enabled Graphics Tablet

Yuichi Murata, Buntarou Shizuki Jiro Tanaka

Department of Computer Science, Graduate School of Systems and Information Engineering, University of Tsukuba, 1-1-1 Tennodai, Tsukuba-shi, Ibaraki 305-8573 Japan, {murata,shizuki,jiro}@iplab.cs.tuskuba.ac.jp

Abstract

We present slide operations using multi-touch functionality and web camera view as a presentation interface using graphics tablet devices (GTDs). Some presentation systems provide an ink annotation feature and it is often used with GTDs. However, many presentation systems are still optimized for a keyboard and a mouse. To support the presentation using GTDs, the presentation systems need interface optimized for GTDs. Our presentation interface, Shadowgraph II provides slide operations with multi-touch and web camera view to show the presenter's facial expression.

keywords: Presentation, Graphics Tablet Devices

1 INTRODUCTION

Some presentation systems provide an ink annotation feature. It allows a presenter to give supplemental annotations to an audience easily. The ink annotation feature is used with graphics tablet devices (GTDs), such as tablet PCs and pen displays.

However many presentation interfaces are still optimized for traditional interfaces such as a mouse and a keyboard. Interfaces optimized for GTDs are needed to fully support the GTD-based presentation. Based-on this idea, we have developed Shadowgraph which is a GTD-based presentation interface [1].

In this paper, we present new features of Shadowgraph: slide operations using multi-touch functionality of GTDs and a web camera view.a There are two ideas. One is employing not only stylus input functionality but also multi-touch functionality to improve the usability. The other is employing web camera to present the presenter's facial expression that are often hard to do when the presenter is drawing on GTDs. We designed these features and implemented them as a new version of Shadowgraph, Shadowgraph II.

2 SLIDE OPERATIONS WITH MULTI-TOUCH

We employed multi-touch gestures for slide operations. Touch operations are suitable for GTD-based presentations because both touch input and GTD input are direct pointing. And also some GTDs support multi-touch.

The presenter can go to the next or previous slide by flipping gestures, i.e. dragging with two fingers. Dragging the screen left to shows the next slide and dragging the screen to right shows the previous one.

The presenter can jump to any slide using a pinch-in gesture. This gesture shows Slide Selector (see Figure 1). On Slide Selector, all slides are presented as small thumbnails. Now the presenter can select one of the thumbnails to jump to the corresponding slide.

The thumbnails are rendered as 3D surfaces with perspective. With this perspective, Shadowgraph II displays many thumbnails while the presenter can easily find and select an intended thumbnail among them.

Rendering with 3D perspective needs graphics hardware with higher performance. However recent personal computers have a capability to draw objects with the 3D perspective, therefore they have enough performance to draw them.

Note that the slide operation with multi-touch is available on the same input area for the drawing but the different input channel. Therefore the presenter can quickly change the slides but the slide operation interface does not disturb the drawing.



Figure 1: Slide Selector allows the presenter to easily find and select an intended slide.

3 WEB CAMERA VIEW

Eye contacting and facial expressions are important in presentations. However, the presenter tends to watch the presenter's screen while they are drawing on GTDs. We believe the audience can understand more about the presentation by seeing the presenter's eye contacting and facial expressions.

We implemented head up web camera view on Shadowgraph II. This presents the presenter's facial expressions and maintains the eye contacting through a web camera even while the presenter is drawing on the input area on a GTD. Moreover, this feature also supports the eye contacting and facial expressions on presentations in large hall where the audience hardly sees the presenter's face.

Shadowgraph II presents the web camera view next to the current slide (see Figure 2). When the web camera view is activated, the current slide and the web camera view are presented with 3D perspective. With this perspective, Shadowgraph II can present them with higher space efficiency.

In addition, full screen mode of the web camera view is also available. The presenter can present only his/her face when the presenter want to convey the strong message with his/herself, or even can do some demonstration of the real products with body actions in this mode.



Figure 2: The web camera view presents the presenter's facial expressions and keeps eye contacting with the audience.

4 IMPLEMENTATION

We implemented Shadowgraph II using C++ and openFrameworks. The slides are bitmaps exported from some presentation authoring tools. Shadowgraph II loads the slide bitmaps into textures. Shadowgraph II also captures the image of the web camera into a texture and presents it on the screen.

Hardware composition is shown in Figure 3. We employed WACOM BAMBOO FUN CTH-661 as a GTD. This device can detect multi-touch gestures as well as drawing by a pen device. It sends the gesture events as special key events to application software. Shadowgraph II receives the special key events to handle the gesture events.



Figure 3: Hardware composition.

5 RELATED WORK

There is related work that supports presentation using GTDs. Classroom Presenter[2] is a pen-based presentation tool. Richard et al. deployed Classroom Presenter in a lecture room in a University and examined it. Kotodama[3] is also a pen-based presentation tool and is examined in schools. These systems mainly focus on the usage of digital ink.

There is related work that presents presentation materials in other style. Counter Point[4], Kotodama[3] and Borderless Canvas[5] are based on ZUI (Zoomable User Interface) and present presentation contents on it.

In contrast, our focus is how to enhance the usability on the presentation using GTDs. With this reason, we decided to enhance the usability in presenting and manipulating the ordinal presentation slides.

6 CONCLUSIONS

We present slide operations using multi-touch functionality and a web camera view as a presentation interface for GTDs. With the multi-touch operations, the presenter can change slides and draw annotations on the same input area but on different input channel. The web camera view presents the presenter's facial expressions and maintains eye contacting even though the presenter is drawing.

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