Pseudo-3D Photo Collage

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1   Introduction

Pseudo-3D photo collage is a new technique for creating extensive pseudo-3D scenes on the Web. This technique enables users to create, publish, navigate and share pseudo-3D scenes by easy operations. Our basic idea comes from an artistic representation "photo collage" on 2D canvases, that is, a general method of scanning and arranging original photos. Photo collage is originally 2D and static graphic representation, while our proposed representation is pseudo-3D and interactive one. Our developed system for pseudo-3D photo collage is called STAMP (Spatio-Temporal Associations with Multiple Photographs). STAMP includes basic two components as tools: *STAMP-Maker* and *STAMP-Navigator*, for creating and navigating pseudo-3D scenes respectively.

2   Methods

2.1   Creating Pseudo-3D scenes

By using *STAMP-Maker*, users apply their own photos and make spatial-hyperlinks between them (Figure 1). Spatial-hyperlinks are defined such that the rectangle specified in the photo at one end of the link is mapped onto the corresponding rectangle specified in the photo at the other end of the link. Users draw one rectangle enclosing the object on each of the two photos (Figure 2). After drawing two corresponding rectangles, the two photos are automatically distorted and superposed by matching the corresponding rectangles (Figure 2).

  Users can create several spatial-hyperlinks on one photo. Therefore, a pseudo-3D scene includes many different routes for navigations. A pseudo-3D scene is a kind of hypermedia, because making an association between two different photos is similar to attaching a start anchor and an end anchor to two HTML pages in order to create a hyperlink between them.
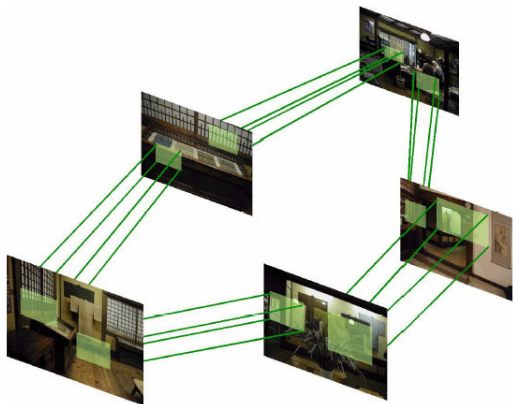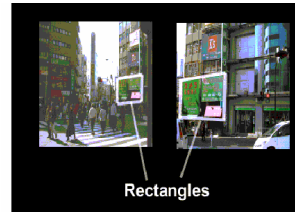

Figure1: photos and spatial-hyperlinks
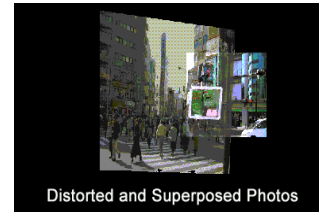

Figure 2: corresponding rectangles   Figure 3: superposed photos

2.2   Navigating Pseudo-3D scenes

By using *STAMP-Navigator*, users can navigate web-published pseudo-3D scenes through a simple interface. A scene consists of a key photo and the photos linked to it. The key photo is placed in the center of the display, and linked photos are placed at transformed positions (Figure 4). A scene transits to the next when users click on one of the linked photos. In a transition to the next scene, the current key photo fades out and the next key photo moves over to the center (Figure 5). This animation gives the user a sense of motion to the next position. Thus, users can freely step forward, step backward, step sideward, rotate, and zoom in/out in the pseudo-3D scenes only by clicking.
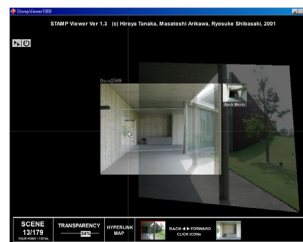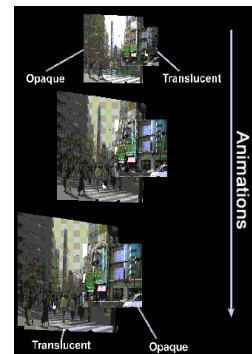

Figure 4: navigation interface

Figure 5: A scene transition

3   Conclusions

Both Pseudo-3D photo collage and QuickTime VR use photos to create a virtual space. QuickTime VR, however, limits itself to a panoramic scene. Pseudo-3D photo collage has an advantage of handling a depth dimension in making a virtual walkthrough. Pseudo-3D photo collage also differs from video in its ability to represent multiple paths in scene transitions, including branches, loops, reverse motions, and terminals.

  These days many people want to create and publish their original 3D contents on the Web, and therefore easy and useful tools are necessary. STAMP can be expected as a versatile tool for ordinary people to make much use of their photos in a new spatio-temporal style.