PaperView

Overview

PaperView is a **tabletop augmented reality** system that supports the exploration of **terrain-based information** (e.g., areas of interest on a 2D map, or a 3D scale model) using rectangular pieces of **plain cardboard**. The system allows users to study information and interactive multimedia, using the cardboards as individual interactive screens; these cardboard screens can be lifted and held at various angles. Multiple users can concurrently use the table.

Two users interacting with PaperView

The system comprises the surface to be augmented (e.g., a plain wooden table), a projector, an RGB camera, a PC and speakers. Rectangular pieces of plain white cardboard of various sizes surrounded by a colored frame are used. A computer vision system is used to track the position and pose of the paper surfaces, as well as the activation of any related interactive areas by the users' fingers.

When a user places a cardboard piece over the table surface, an image is projected on it, adding detail to the surface image. Furthermore, a pointer (i.e., a magnifying glass) is projected on the paper's center, which assists the user in exploring the surface, guiding her/him to the information hotspots available. When a hotspot is selected, a multimedia slideshow starts. The slideshow comprises a series of pages, each of which may contain any combination of text, images, and videos.

Selecting an information hotspot

At the bottom area of the slideshow, a toolbar is projected containing an indication of the current page and the total number of pages available, as well as buttons for moving to the next/previous page. The visitor may interact with these "soft" buttons through touch. If the paper is taken off the table's surface, the buttons disappear and the user can move to the next/previous page, by tilting the paper right or left, respectively. In this case, the projection is appropriately distorted, so that the visual content registers correctly to the paper surface.
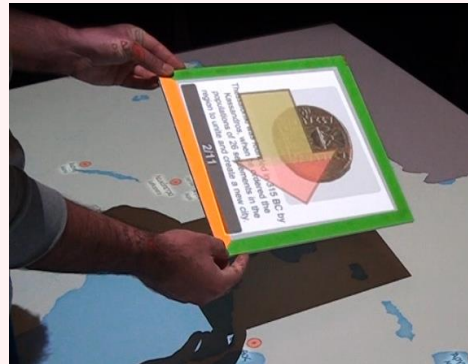

Viewing multimedia information

Target Domains

The system is suitable for museums or any other type of exhibition space that wish to offer their visitors the ability to explore information over a physical area or object (i.e., not a digital screen).

Lifting the paper above the table surface

Tilting the paper to browse content

Additional Information

The system has been instantiated and tested in three setups: (i) a map of Macedonia, Greece, including ancient Greek cities with archeological interest; (ii) a glass case containing a scale model and (iii) a part of Rigas Velestinlis' Charta. The first two systems are currently installed and available to the general public at the Archaeological Museum of Thessaloniki, Greece, as part of a permanent exhibition of interactive systems *(www.makedonopixels.org)*

Permanent public installations:

- Infopoint, Tourism Office, Municipality of Heraklion
- Tourism Information Center, Municipality of Hersonissos
- National Research Foundation "Eleftherios K. Venizelos", Chania
- Archaeological Museum of Thessaloniki as part of "Macedonia: From fragments to pixels" exhibition *www.makedonopixels.org*

Related video: *http://youtu.be/5HKB15ZeUwE*

Paperview web page
www.ics.forth.gr/ami/project/paperview/

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